

zuma Mining Co. (1901). **Ore:** Copper, gold. **Ore min:** Chalcopyrite. **Deposit:** Fissure vein in diorite. **Dev:** Small amount. **Ref:** 88, p. 91.

#### Clipper (Mothers Day) (5)

**Loc:** N $\frac{1}{2}$ NE $\frac{1}{4}$  sec. 25, (18-7E), adjoining Surprise group on the SE. **Access:** Trail. **Owner:** Stanley Slejeski and Charles Zinski, Tacoma, Wash. (1943). **Ore:** Copper. **Ore min:** Chalcopyrite, pyrite, arsenopyrite, malachite. **Gangue:** Quartz, tourmaline. **Deposit:** Mineralized vertical joints in granodiorite as much as 4 in. wide. **Dev:** 900-ft. adit with 3 or 4 short crosscuts. **Ref:** 88, p. 91. 158.

#### Copper King (9)

**Loc:** SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 19, (18-8E),  $\frac{1}{2}$  mi. N. of Coplay Lk. **Elev:** 4,160 ft. **Access:** Road from Fairfax. **Owner:** Lawrence Falick, Tacoma, Wash. (1941). **Ore:** Copper. **Ore min:** Malachite, pyrite. **Gangue:** Quartz, tourmaline. **Deposit:** Veinlets in granodiorite. **Dev:** 50-ft. adit, 76-ft. adit, caved adit (1941). **Prod:** Test shipment in 1918. **Ref:** 97, 1919, p. 492. 158.

#### East Lake (7)

**Loc:**  $\frac{1}{2}$  mi. due E. of the Surprise group. **Prop:** 6 claims. **Owner:** Washington Co-operative Mining Syndicate (1901-1907). **Ore:** Copper. **Ore min:** Chalcopyrite. **Deposit:** A number of veins in syenite. **Ref:** 33, 1907, p. 1154. 88, p. 91.

#### Eastlick

**Loc:** Carbon R. dist. **Owner:** Copper King Mining Syndicate (1907-1918). **Ore:** Copper. **Ref:** 33, 1907, p. 523. 98, 1918, p. 75.

#### Golden Rule (8)

(see under zinc)

#### Larigo

(see Tillie and Larigo)

#### Lone Star

**Loc:** Summit dist. **Ore:** Copper, gold, silver. **Ref:** 63, p. 46.

#### Lorraine

**Loc:** Carbon R. dist. **Owner:** Lorraine Copper Mining Co. (1907-1908). **Ore:** Copper, silver, gold. **Ref:** 33, 1907, p. 752; 1908, p. 888.

#### Mashel (1)

**Loc:** N $\frac{1}{2}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 22, (16-4E). **Access:** 2 mi. W. of Eatonville by road. **Owner:** Mr. Denman. **Ore:** Copper. **Ore min:** Native copper. **Gangue:** Altered volcanics. **Deposit:** Brownish-red altered lava with thin seams of native copper along joints. Rock exposed for  $\frac{1}{2}$  mi. along creek. **Prod:** Mined for copper in 1900's. Later used for paint pigment. **Ref:** 158.

#### Mothers Day

(see Clipper)

#### Mt. Rainier

(see Storbo)

#### New Deal

(see Washington Cascade under gold)

#### Silver Creek (12)

(see under gold)

#### Silver Creek Gold & Lead (11)

(see under gold)

#### Storbo (Mt. Rainier) (10)

**Loc:** Approx. sec. 8, (16-9E), at head of Inter Fk. of White R. on N. side of Mt. Rainier. **Access:** Trail. **Owner:** Mount Rainier Mining Co., Inc., Seattle, Wash. (1916—). **Ore:** Copper. **Ore min:** Chalcopyrite. **Gangue:** Tourmaline. **Deposit:**

Lenticularly and intermittently mineralized fractures in Keechelus andesite up to 1 ft. thick. **Dev:** 7 adits totaling about 1,500 ft. of workings. **Improv:** 1 cabin (1952). **Prod:** 1915-1917, 1926, 1928. **Ref:** 68, p. 12. 97, 1915-1917, 1926, 1928. 158.

#### Surprise (6)

**Loc:** N $\frac{1}{2}$ NE $\frac{1}{4}$  sec. 25, (18-7E), on E. side of Old Baldy Mtn. halfway between Coplay and Summit Lakes, Carbon R. dist. **Elev:** 4,000 ft. **Access:** Trail up Cayada Cr. from Carbon R. road. **Prop:** 13 claims, including Surprise and Hog Back. **Owner:** C. T. Stafford, Tacoma, Wash. (1943). A. B. Crain (1941). **Ore:** Copper, gold. **Ore min:** Chalcopyrite, bornite, pyrite. **Gangue:** Tourmaline, quartz. **Deposit:** Joint planes in granodiorite have been hydrothermally altered and mineralized. Mineralized portions range in width from 2 to 12 in. **Dev:** 465-ft. adit with 2 short raises. **Prod:** Test shipment in 1919. **Ref:** 88, pp. 90-91. 158.

#### Tacoma

(see also Washington Cascade under gold)

**Loc:** On Mowich R., 17 mi. by trail SE. of Fairfax, Carbon R. dist. **Access:** Trail. **Prop:** 4 claims. **Owner:** Blue Bell Gold Mining Co., Tacoma, Wash. (1938). Washington Co-operative Mining Syndicate (1901-1907). Washington Cascade Mining Co., Tacoma, Wash. (1938). **Ore:** Copper, gold, silver. **Ore min:** Chalcopyrite. **Gangue:** Calcite. **Deposit:** Mineralized zone 25 ft. wide contains disseminated chalcopyrite. Also a rich streak 3 ft. wide along the footwall. **Dev:** 200-ft. drift with 5 crosscuts aggregating 100 ft. **Assays:** Said to carry 5% to 33% Cu, \$2 Au, \$3.50 Ag. **Prod:** Test shipments about 1900. **Ref:** 33, 1907, p. 1154. 88, p. 92. 158.

#### Tillie and Larigo (3)

**Loc:** Sec. 33, (18-7E), across Carbon R. from Mt. Rainier National Park entrance. **Elev:** 300 ft. above valley floor. **Owner:** L. Falick (1941). **Ore:** Copper. **Ore min:** Chalcopyrite, pyrite. **Deposit:** Veinlets of sulfides less than  $\frac{1}{2}$  in. wide cut granodiorite. **Ref:** 158.

#### Vanguard

**Loc:** Eatonville area. **Ore:** Copper. **Ref:** 63, p. 46. 169, pp. 41-42.

#### Washington Cascade (13)

(see under gold)

#### Washington-Wonder

**Loc:** Fairfax area. **Ore:** Copper. **Prod:** Development ore shipped in 1910. **Ref:** 97, 1910, p. 604.

#### Wonder

(see Washington-Wonder)

### SKAGIT COUNTY

#### Anacopper (1)

**Loc:**  $3\frac{1}{2}$  mi. SW. from center of Anacortes, but within city limits. **Access:** Road. **Prop:** 20 acres deeded land. **Owner:** R. M. Brown, Seattle, Wash. (1941). M. Donopolis and S. W. Schreiber, Anacortes, Wash. (1934). **Ore:** Copper, gold, silver. **Ore min:** Copper carbonates. **Deposit:** Copper disseminated and in fractures in shear zone in granite. **Dev:** 8 shallow shafts. **Assays:** 1% to 2 $\frac{1}{2}$ % Cu, 0.05 oz. Au, 1 oz. Ag in sample from dump. **Ref:** 157. 158.

#### Bald Mountain (4)

**Loc:** Sec. 17, (34-6E), near summit of Bald Mtn. **Access:** Road and trail from Clear Lk. **Owner:** Bald Mountain Mining Co. (1902). **Ore:** Copper, gold. **Deposit:** Mineralized zone 16 ft. wide in schist. **Dev:** 60-ft. shaft, 50-ft. shaft, and 420-ft. crosscut adit. **Assays:** One assay showed 30% Cu, \$3.00 Au. **Ref:** 88, p. 52.

**Bornite**

(see North Coast under gold)

**Boston (10)**

(see under lead)

**British**

(see Skagit Queen under silver)

**Buchanan**

(see Queen and Buchanan)

**Cliff (12)**

(see under zinc)

**Dispassi****Loc:** On Dispassi Cr., 5 mi. up Skagit R. from Marblemount.**Ore:** Copper, gold. **Ref:** 63, p. 54.**Dorothy**

(see Thunder Creek under lead)

**Ella Bea and Flaim (16)****Loc:** NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 35, (35-13E), W. of Soldier Boy Cr. **Access:** Trail. **Prop:** 2 claims: Ella Bea, Flaim. **Ore:** Copper. **Ore min:** Pyrite. **Deposit:** Altered and pyritized rock. **Dev:** Open cuts. **Assays:** One assay showed no Au, 0.06% Cu. Another assay showed no Au, 0.07% Cu. **Ref:** 158.**Elsie (11)****Loc:** SE $\frac{1}{4}$  sec. 24, (35-13E), in Boston Basin. **Access:** About 2 mi. by trail from road. **Prop:** 2 claims: Elsie, Pochantes. **Owner:** O. W. Mandahl, Sedro Woolley, Wash. (1951). **Ore:** Copper. **Ore min:** Chalcopyrite, pyrite. **Gangue:** Quartz. **Deposit:** 2 parallel stringers about 4 ft. apart in diorite. **Dev:** 50-ft. adit. **Ref:** 158.**Fidalgo**

(see under manganese)

**Fidalgo (Stephens)**

(see Stephens)

**Fidalgo Island (3)****Loc:** Secs. 1 and 2, (34-1E). **Access:** 4 $\frac{1}{2}$  mi. by road to railroad at Anacortes. **Owner:** Lester E. Gibbons, Anacortes, Wash. (1940). **Ore:** Copper, gold, silver. **Deposit:** Vein 4 ft. wide. **Dev:** 20-ft. shaft. **Assays:** \$20.00 per ton. **Ref:** 158.**Flaim**

(see Ella Bea and Flaim)

**Higgins Mountain**

(see Lawrence)

**Jackman Creek****Loc:** Cascade dist. **Ore:** Copper. **Ref:** 158.**Johnsburg (15)**

(see under lead)

**Lakeside**

(see under lead)

**Lawrence (Higgins Mountain) (5)****Loc:** SW $\frac{1}{4}$  sec. 28, (33-8E), on N. slope of Higgins Mtn. **Access:** Trail from Darrington highway 1 mi. W. of Hazel. **Prop:** 2 claims: Nugget Nos. 1 and 2. **Owner:** W. J. Lee (1941). **Ore:** Copper. **Ore min:** Chalcopyrite, pyrite, bornite, arsenopyrite, tetrahedrite (?). **Deposit:** A 3-ft. fracture zone in granodiorite contains 3 mineralized quartz stringers from  $\frac{1}{2}$  to 9 in. wide. Granodiorite is in the form of a 50-ft. dike cutting Chuckanut sediments. **Dev:** Reportedly an adit. **Ref:** 158.**Logan No. 2 (7)**

(see under silver)

**Marine**

(see under gold)

**Matrix****Loc:** 6 mi. SW. of Anacortes. **Access:** Road. **Prop:** 150 acres deeded land. **Owner:** Matrix Mining and Milling Co. (1934). **Ore:** Copper, gold. **Ore min:** Pyrite, chalcopyrite, bornite, copper. **Deposit:** Lenses in sheared zones in granodiorite and greenstone. **Dev:** 40-ft. shaft, several open cuts. **Assays:** \$5.00 to \$55.00. **Ref:** 158.**Midas (13)**

(see under silver)

**Mountain Home**

(see under manganese)

**North Coast (6)**

(see under gold)

**Protection (8)**

(see under lead)

**Queen and Buchanan (17)****Loc:** SW. side of Cascade R., in NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 35, (35-13E). **Access:** Trail. **Prop:** 2 unpatented claims: Queen, Buchanan. **Owner:** Rupert Buchanan, Rockport, Wash. (1951). **Ore:** Copper, lead. **Ore min:** Chalcopyrite, pyrite, galena. **Gangue:** Quartz. **Deposit:** 3-ft. hydrothermally altered sheared zone in 40-ft. hornblende dike. Sulfides in zone 3 to 6 in. wide. **Dev:** 80-ft. adit. **Ref:** 158.**Skagit Queen (9)**

(see under silver)

**Soldier Boy (14)**

(see under gold)

**Standard**

(see under silver)

**Stephens (Fidalgo) (2)****Loc:** Center N $\frac{1}{2}$  sec. 26, (35-1E), within city limits of Anacortes. **Access:** Road within 300 ft. of workings. **Owner:** Brown Bros. Timber Co. and James Stephens, Seattle, Wash. (1943). **Ore:** Copper, gold, silver. **Ore min:** Pyrite, chalcopyrite. **Gangue:** Quartz, chlorite. **Deposit:** Shear zone in granodiorite 10 ft. wide and exposed for 600 ft. Zone is serpentinized and weakly mineralized. **Dev:** 5 shallow shafts and an open cut. **Assays:** Shipment said to have run 2% copper with a little gold and silver. **Prod:** 1 shipment to Tacoma smelter. **Ref:** 158.**Thunder Creek**

(see under lead)

**SKAMANIA COUNTY****Athens****Loc:** Mining Cr., Mt. St. Helens dist. **Ore:** Copper, gold, silver, lead, zinc. **Ref:** 63, p. 50.**Black Falls****Loc:** NW $\frac{1}{4}$  sec. 18, (10-6E), Mt. St. Helens dist. **Ore:** Copper. **Ref:** 63, p. 50.**Black Hornet****Loc:** T. 10 N., R. 5 E., Mt. St. Helens dist. **Ore:** Copper. **Ore min:** Chalcopyrite, pyrite. **Deposit:** 4-ft. vein. **Ref:** 63, p. 50.

**Bronze Monarch (Martha Washington) (22)**

**Loc:** Sec. 36, (10-5E), adjoining the Sweden property on the NW., Mt. St. Helens dist. **Elev:** 3,700 ft. **Access:** ¾ mi. by trail from Sweden property. **Owner:** Mount St. Helens Consolidated Mining Co. (1907-1926). Mining Corporation of Portland, Ltd. (1902). Bronze Monarch Mining Co. (1907). **Ore:** Copper, gold, silver. **Ore min:** Pyrite, lesser amounts of chalcopyrite. **Deposit:** Fault zone in granite 3 ft. wide. Mineralized quartz cements breccia in the zone. **Dev:** 300-ft. adit. **Assays:** Ore said to av. \$28 in Cu, Au, Ag. **Ref:** 33, 1907, p. 800; 1908, p. 952. 88, p. 95. 98, 1920-1926.

**Bumble Bee**

**Loc:** T. 10 N., R. 5 E., Mt. St. Helens dist. **Ore:** Copper, lead, zinc. **Ore min:** Chalcopyrite, galena, sphalerite. **Deposit:** 4½-ft. vein with 8- and 10-in. paystreaks. **Ref:** 63, p. 50.

**Chicago (16)**

**Loc:** NW¼ sec. 32, (10-6E), 2½ mi. NE. of Spirit Lk., Mt. St. Helens dist. **Access:** ¾ mi. by trail E. of Norway Pass. **Prop:** Several claims. **Owner:** Mining Corporation, Ltd. of Portland (1902). **Ore:** Copper, gold, silver, zinc. **Ore min:** Pyrite, arsenopyrite, chalcopyrite, sphalerite, native copper. **Deposit:** An 8-in. quartz vein in granodiorite. **Dev:** 200-ft. adit. **Assays:** Two assays showed 0.3% to 2.0% Cu, tr. to 0.10% Pb, 0.5% to 1.8% Zn, 0.11 to 0.12 oz. Au, 0.04 to 0.09 oz. Ag. **Ref:** 63, p. 50. 88, pp. 95-96. 111, p. 5.

**Chief**

(see Ripper and Chief)

**Cinnabar (3)**

(see also Toledo)

**Loc:** Sec. 13, (10-5E), Mt. St. Helens dist. **Prop:** Part of Toledo group. **Ore:** Copper. **Ref:** 63, p. 50.

**Coe**

(see Sweden)

**Columbia Gold and Copper**

(see Miners Queen)

**Commonwealth (15)**

**Loc:** Near SW. cor. sec. 33, (10-6E), Mt. St. Helens dist. **Access:** 6 mi. NE. of Spirit Lk. Ranger Station on the Spirit Lk.-Guler trail. **Ore:** Copper, zinc, lead. **Ore min:** Chalcopyrite, sphalerite, galena, arsenopyrite. **Deposit:** Shear zone in basalt contains irregular lenses of quartz as much as 2 ft. wide. Ore minerals occur in the quartz and along fractures in the footwall. **Dev:** 340-ft. drift and a shaft. **Ref:** 158.

**Copper Bottom**

**Loc:** T. 10 N., R. 5 E., Mt. St. Helens dist. **Ore:** Copper, lead. **Ore min:** Chalcopyrite, galena. **Ref:** 63, p. 50.

**Copper Canyon Mines**

(see Yellow Jacket and Hoo Hoo)

**Copper Dyke**

**Loc:** Mt. St. Helens dist. **Ore:** Copper, gold. **Assays:** 2% Cu, \$1.00 Au (1902). **Ref:** 105, no. 2, 1902, p. 29.

**Crystal (1)**

**Loc:** Sec. 8, (10-5E), Mt. St. Helens dist. **Owner:** Messrs. Koontz, Witt, Burbee (1897). **Ore:** Copper. **Dev:** 36-ft. shaft. **Ref:** 63, p. 50.

**Earl**

(see Samson)

**Germania (10)**

(see under gold)

**Goat Mountain**

**Loc:** Mt. St. Helens dist. **Ore:** Copper. **Ref:** 158.

**Golconda (12)**

(see under gold)

**Gold Creek**

(see Zinc Creek under zinc)

**Grizzly Creek (13)**

(see under gold)

**Hoo Hoo**

(see Yellow Jacket and Hoo Hoo)

**Independence (6)**

**Loc:** Secs. 2, 3, 10, and 11, (10-5E), on Black Mtn., opposite the Minnie Lee mine, Mt. St. Helens dist. **Access:** Trail. **Prop:** 6 claims. **Ore:** Copper, gold, silver, lead. **Ore min:** Bornite. **Deposit:** Vein 14 in. to 4 ft. wide in granite. **Dev:** 3 adits, one of which has 125 ft. of crosscut and 275 ft. of drifts. **Assays:** \$30 in Au, Ag, Cu, Pb. **Ref:** 58, p. 32. 158.

**Index (5)**

**Loc:** Near SE. cor. sec. 18, (10-6E), 2½ mi. NW. of the Chicago group, Mt. St. Helens dist. **Prop:** 12 claims: Index Nos. 1 to 12. **Owner:** Mount St. Helens Consolidated Mining Co. (1907-1926). Mining Corporation, Ltd. of Portland (1902). **Ore:** Copper, gold, silver. **Ref:** 33, 1907, p. 800; 1908, p. 952. 88, p. 96. 98, 1920-1926. 158.

**Juanita**

**Loc:** About ½ mi. from the source of Green R. **Owner:** U. M. Lauman, W. A. Reynolds, and David Stuart (1901). **Ore:** Copper, gold. **Deposit:** Vein 6½ ft. wide. **Dev:** 50-ft. adit. **Assays:** Ore av. \$37 in Cu, Au. **Ref:** 88, pp. 96-97.

**Last Chance (28)**

**Loc:** SW¼SE¼ sec. 29, (3-5E), on Washougal R. **Elev:** 1,600 ft. **Access:** 14 mi. by road and 1 mi. by trail from railroad at Cape Horn. **Owner:** Leon Montchalin, Washougal, Wash. (1953—). H. S. McGowan, McGowan, Wash. (1943). Mable McGowan, Chinook, Wash. (1951-1953). **Ore:** Copper, vanadium, gold, silver, lead, zinc. **Ore min:** Bornite, chrysocolla, descloizite (?). **Deposit:** Shear zone in diorite contains several parallel veins of quartz. Main vein is 1 to 4 ft. wide. Zone as a whole is sparsely mineralized. **Dev:** Shaft reportedly 475 ft. deep, 930-ft. adit, and another adit caved at the portal. **Assays:** Vein est. to carry 1.5% Cu over a width of 1 to 3 ft. for length of 400 ft. Picked samples show 1% to 2% V<sub>2</sub>O<sub>5</sub> and 0.25% to 0.50% on composite samples. Other assays show an av. of 0.13 oz. Au, 7.2 oz. Ag, 7.5% Cu. Green and yellow material found coating druses at face of the adit was the material which showed V<sub>2</sub>O<sub>5</sub> content. Spectrographic analysis of the green and yellow coatings showed 1% to 10% V, 1% to 10% Pb, 8% Cu, 8% Zn. **Ref:** 158.

**Last Hope (4)**

**Loc:** Sec. 13, (10-5E), Mt. St. Helens dist. **Ore:** Copper. **Ref:** 63, p. 50.

**Martha Washington**

(see Bronze Monarch)

**Maybee (24)**

**Loc:** S½NW¼ sec. 14, (3-5E), Washougal R. area. **Access:** Road to within 1 mi. **Prop:** State lease. **Owner:** W. C. Daly, Portland, Ore. (1952—). **Ore:** Copper, gold. **Ore min:** Chalcopyrite, bornite. **Dev:** 3,000-ft. adit, 1,000-ft. incline shaft, caved (1952). **Prod:** 6 or more wagonloads of mill conc. in 1917. **Ref:** 157. 158.

**Miners Queen (Columbia Gold and Copper) (23)**

**Loc:** Near center N½ sec. 4, (3-5E), on Miners Cr., Washougal dist. **Access:** 4½ mi. by road from Sunset Ranger Station. 15 mi. by road to railroad at Yacolt. **Prop:** 7 claims. **Owner:** J. W. McMahon, Portland, Oreg. (1950—). **Ore:** Copper, molybdenum. **Ore min:** Chalcopryrite, magnetite, malachite, molybdenite, pyrite. **Gangue:** Quartz, tourmaline, sericite. **Deposit:** An area about 80 by 140 ft. in which are small discontinuous veinlets and disseminations of copper and molybdenum sulfides in altered diorite. **Dev:** 6 short adits, 30-ft. shaft, a deeper shaft. Several hundred ft. of diamond drilling in 3 holes had been completed by the U. S. Bureau of Mines by the end of July 1955. **Assays:** Best ore shows about 3% Cu. **Ref:** 157. 158.

**Minnie Alice (2)**

**Loc:** Sec. 8, (10-5E), Mt. St. Helens dist. **Ore:** Copper, silver. **Ref:** 63, p. 50.

**Minnie Lee (7)**

**Loc:** Secs. 2 and 3 (?), or sec. 18 (?), (10-5E), Mt. St. Helens dist. **Owner:** Mount St. Helens Consolidated Mining Co. (1907-1926). Cascadia Mining & Development Co. (1902-1926). **Ore:** Copper, silver, gold. **Ref:** 33, 1907, p. 800; 1908, p. 952. 58, p. 44. 98, 1922-1926.

**Morning (14)**

**Loc:** NE¼ sec. 20, (10-6E), Mt. St. Helens dist. **Ore:** Copper. **Ref:** 158.

**Mount Fairy (17)**

(see under gold)

**Mountain King**

**Loc:** Washougal dist. **Ore:** Copper, gold, silver. **Ref:** 105, 1903, p. 111.

**Northern Light**

**Loc:** Mt. St. Helens dist. **Owner:** Spirit Lake Power and Mining Co. (1908-1915). **Ore:** Copper. **Ref:** 158.

**Northwestern**

**Loc:** Mt. St. Helens dist. **Ore:** Copper. **Ref:** 158.

**Norway (18)**

(see also Sweden)

**Loc:** Near SW. cor. sec. 31, (10-6E), 1,000 ft. up the mountain from the Bronze Monarch property, Mt. St. Helens dist. **Elev:** 3,648 ft. **Access:** Trail from Sweden mine. **Prop:** 9 claims. **Owner:** Mount St. Helens Consolidated Mining Co. (1907-1942). Mining Corporation, Ltd. of Portland (1902). **Ore:** Copper, gold, silver. **Ore min:** Pyrite, chalcopryrite, pyrrhotite. **Gangue:** Breccia, gouge, quartz. **Deposit:** A brecciated zone 4 ft. wide in granodiorite contains a little disseminated pyrite and chalcopryrite. **Dev:** 350-ft. adit. **Assays:** 5 samples from an ore shoot 50 ft. long gave a weighted av. of 2.44% Cu across 3.9-ft. thickness. **Ref:** 33, 1907, p. 800; 1908, p. 952. 88, p. 95. 98, 1920-1926. 157. 158.

**Polar Star (11)**

**Loc:** SW¼ sec. 17, (10-6E), near Black Falls on Green R., Mt. St. Helens dist. **Prop:** 11 patented and 19 unpatented claims. **Owner:** Geo. S. Reid, Portland, Oreg. (1941). Cascadia Mining & Development Co. (1902-1926). Mount St. Helens Consolidated Mining Co. (1907-1926). **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, pyrite, malachite. **Gangue:** Quartz, sericite, breccia. **Deposit:** Breccia zone in granite from a few in. to 2 ft. wide is leached, silicified, and sericitized. Mineralization is light and consists mostly of pyrite. **Dev:** 80-ft. adit with an 84-ft. drift, 35-ft. shaft, 900-ft. adit. **Assays:**

4% to 15% Cu, 0.095 oz. Au, 3 to 5 oz. Ag. **Prod:** Small amount prior to 1934. **Ref:** 33, 1907, p. 452; 1908, p. 952. 58, p. 55. 63, p. 50. 88, p. 96. 91, pp. 247-248. 98, 1918-1926. 114, no. 6, 1906, p. 79. 158.

**Portland Elkhorn**

**Loc:** Mt. St. Helens dist. **Ore:** Copper. **Ref:** 158.

**Rainbow (27)**

(see under vanadium)

**Ripper and Chief**

**Loc:** About 4 mi. NE. of Spirit Lk., Mt. St. Helens dist. **Prop:** 2 claims: Ripper, Chief. **Owner:** Messrs. McClure and Hostetter (1901). **Ore:** Copper, gold, lead. **Ore min:** Chalcopryrite, galena. **Deposit:** Vein about 4 ft. wide. **Assays:** Max. \$60 in Cu, Au. **Ref:** 88, p. 97.

**St. Helens**

(see Sweden)

**Samson (Earl) (9)**

**Loc:** SE¼ sec. 8, (10-6E), at base of Goat Mtn., Mt. St. Helens dist. **Prop:** 20 claims. **Owner:** Mount St. Helens Consolidated Mining Co. (1907-1926). Mining Corporation, Ltd. (1901). **Ore:** Copper, gold, silver. **Deposit:** Large low-grade deposit said to be 500 to 1,000 ft. wide. **Dev:** 600 ft. of adit. **Assays:** Max. \$3 in Cu, Au, Ag. **Ref:** 33, 1907, p. 800; 1908, p. 952. 63, p. 49. 88, p. 96. 98, 1920-1926. 158.

**Skamania (26)**

**Loc:** SE¼SW¼ sec. 21, (3-5E), on W. Fk. of Washougal R. **Elev:** 1,700 ft. **Access:** 16 mi. by road from railroad at Cape Horn. 1½ mi. upstream from the Last Chance mine. **Owner:** L. P. Montchalin, Washougal, Wash., Mabel McGowan, Chinook, Wash. (1953—). **Ore:** Copper, gold, silver, vanadium. **Ore min:** Chalcopryrite, bornite, chalcocite, covellite, malachite, azurite, chrysocolla. **Deposit:** Leached vuggy quartz vein up to 5 ft. thick in granodiorite is sparsely mineralized with copper minerals. **Dev:** 2 adits, one 200 ft. long, the other about 1,000 ft. long, and a 425-ft. shaft near one adit portal. **Assays:** Av. of 4 samples showed 0.06 oz. Au, 3.29 oz. Ag, 4.59% Cu. **Ref:** 105, 1916, pp. 744-745. 158.

**Sweden (Coe, St. Helens) (19)**

(see also Norway)

**Loc:** Near NW. cor. sec. 6, (9-6E), ½ mi. N. of the NE. end of Spirit Lk., Mt. St. Helens dist. **Elev:** 3,340 ft. **Access:** Trail from end of the road on S. side of the lake. **Prop:** 8 claims. **Owner:** Mount St. Helens Consolidated Mining Co. (1905-1943). Mining Corporation, Ltd. of Portland. (1902). **Ore:** Copper, gold, silver, zinc. **Ore min:** Pyrite, chalcopryrite, sphalerite, pyrrhotite. **Gangue:** Quartz. **Deposit:** Fault zone in granite from 6 in. to 4 ft. wide contains sparsely disseminated sulfides. **Dev:** 2,240-ft. adit with 3 crosscuts. Caved at 1,700 ft. (1942). **Assays:** 4 samples from an ore shoot 150 ft. long gave a weighted av. of 2.80% Cu across 3.2-ft. thickness. Another ore shoot 80 ft. long gave a weighted av. from 5 samples of 3.21% Cu across a 4.2-ft. thickness. **Prod:** 2 carloads of ore in 1928. **Ref:** 33, 1907, p. 800; 1908, p. 952. 63, pp. 49-50. 65, p. 2. 88, pp. 94-95. 91, p. 248. 97, 1929, p. 427. 98, 1920-1926. 157. 158.

**Toledo (8)**

(see also Cinnabar)

**Loc:** Sec. 12, (10-5E), Mt. St. Helens dist. **Prop:** Includes Cinnabar property. **Ore:** Copper. **Ref:** 58, p. 68. 63, p. 50.

**Washington**

**Loc:** Mt. St. Helens dist. **Ore:** Copper. **Ref:** 58, p. 71.

**White Swan**

**Loc:** Bald Mtn. area. **Owner:** Washougal Copper & Refining Co. (1916). **Ore:** Copper. **Prod:** Test shipment in 1916. **Ref:** 97, 1916, p. 613.

**Yellow Jacket and Hoo Hoo (Copper Canyon Mines) (26A)**

**Loc:** NE¼ sec. 21, (3-5E), on Washougal R. **Access:** 16½ mi. by road from railroad at Cape Horn. **Prop:** 11 claims. **Owner:** Hugh Ringquist, Camas, Wash. (1953—). **Ore:** Copper, silver. **Assays:** 4½ tons shipped in 1953 ran 5½% Cu, 3.95 oz. Ag. **Ref:** 69-A, p. 9. 158.

**Yellow Metals (20)**

**Loc:** Sec. 31, (10-6E), 2½ mi. NE. of Spirit Lk., Mt. St. Helens dist. **Access:** Trail over Norway Pass. **Prop:** Several claims. **Owner:** Mining Corporation, Ltd., of Portland (1901). **Ore:** Copper, gold, silver. **Deposit:** Similar to the Chicago. **Assays:** Max. \$60 in Cu, Au, Ag. **Ref:** 88, pp. 95-96.

**Young America (21)**

**Loc:** Sec. 6, (9-6E), adjoining Norway and Bronze Monarch properties on the NE., Mt. St. Helens dist. **Prop:** 5 claims. **Owner:** Mining Corporation, Ltd., of Portland (1901). **Ore:** Copper, gold, silver. **Deposit:** Mineralized zone 12 ft. wide is traceable for 2,000 ft. **Dev:** 50-ft. drift. **Ref:** 88, p. 95.

**Zinc Creek (25)**

(see under zinc)

**SNOHOMISH COUNTY****Ala-Dickson (78)**

**Loc:** NE¼ sec. 7, (29-10E). **Elev:** 3,000 ft. **Access:** Near Williamson Cr. trail 3¼ mi. from Sultan R. **Prop:** 2 unpatented claims. **Owner:** John H. and Robert J. Dickson (1943). **Ore:** Copper, lead, zinc, gold, silver. **Ore min:** Galena, sphalerite, pyrrhotite, arsenopyrite, chalcopryrite. **Gangue:** Quartz, talc, and carbonates of calcium, magnesium, and iron. **Deposit:** 4 parallel zones 2 to 3 ft. wide, within an area 90 ft. wide, contain mineralized quartz-carbonate veins 2 to 12 in. wide. Wall rock is serpentinized peridotite. **Assays:** Presence of Ag, Au indicated by assays. **Ref:** 23, pp. 50-51.

**Alleghany**

(see Foggy)

**Alpha**

(see under gold)

**Alta (140)**

(see under gold)

**Anaconda**

**Loc:** 12 mi. above mouth of Beckler R., Index dist. **Prop:** 4 claims. **Owner:** J. Frank Bleakley and Charles Shepp. **Ore:** Copper, silver. **Ore min:** Chalcopryrite, bornite. **Gangue:** Calcite, quartz. **Deposit:** Contact between porphyry and slate. **Ref:** 63, p. 35.

**Arlington (67)**

**Loc:** NE¼ sec. 11, (30-9E), about 2 mi. NW. of Silverton on Marten Cr. **Prop:** 4 claims. **Ore:** Copper, gold, silver, lead. **Ore min:** Chalcopryrite, galena, pyrite. **Deposit:** Quartz vein with max. width of 75 ft. is more or less mineralized with sulfides. **Dev:** 20-ft. adit in ore, 1,000-ft. crosscut not reaching ore. **Assays:** \$12.60 Au, \$6.20 Ag, 35% Cu from the high-grade ore. **Ref:** 14, p. 40. 63, pp. 21-22.

**Armament (Wayside) (175)**

**Loc:** NW¼ sec. 30, (28-11E). **Access:** 7½ mi. from railroad at Index by road along the E. side of the N. Fk. of Skykomish

R. **Prop:** 1 claim: Armament No. 1. **Owner:** Karl and Karin Elizabeth Paykull, Seattle, Wash., leasing from R. M. Brown, Pheom and Marjorie Boyle (1942-1949). Robert McDonald and John H. Cashier (1942). **Ore:** Molybdenum, copper. **Ore min:** Molybdenite, chalcopryrite, pyrite, molybdenite, scheelite, malachite. **Gangue:** Quartz and altered diorite. **Deposit:** Stockwork in gneissoid quartz diorite of short discontinuous quartz veinlets containing molybdenite and chalcopryrite. The ore body has exposed dimensions of 120 ft. by 140 ft. by a 20-ft. depth, but its limits are not known. Veinlets up to 3 in. wide and mostly at least 6 in. apart. **Dev:** Several small open cuts and 2 road cuts. **Assays:** Three 10-ft. channel samples from the better ore showed 0.06%, 0.24%, 0.11% MoS<sub>2</sub>; 0.15%, 0.30%, 0.36% Cu. **Ref:** 14, p. 16. 158.

**Bald Mountain (29)**

**Loc:** 2 mi. N. of Silverton on W. side of Deer Cr., probably in sec. 1, (30-9E). **Access:** Old wagon road up Deer Cr. **Prop:** The Golden Chord claims and the Lakeview claim. **Ore:** Copper, gold, silver, lead. **Ore min:** Chalcopryrite, galena, pyrite. **Deposit:** Quartz vein containing sulfide minerals. An extension of the Arlington vein. **Assays:** \$7 to \$9 in Au, Ag, Cu. **Ref:** 14, p. 40. 63, p. 22.

**Bangor Creek (Bornite) (44)**

**Loc:** Sec. 20, (30-10E), on W. Fk. of Bangor Cr. at mouth of Deer Cr., 1 mi. E. of Silverton. **Elev:** 4,500 ft. **Prop:** 11 claims, 6 millsites. **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, bornite. **Deposit:** Andesite dike carrying bands and masses of bornite and chalcopryrite. Outcrop shows from 4 to 6 ft. of ore. **Dev:** 3,000-ft. crosscut adit that cuts no ore. **Assays:** Av. samples show 12% Cu, 0.051 oz. Au, 4 oz. Ag. **Ref:** 14, p. 41. 158.

**Bear (141)**

(see under gold)

**Beckler River**

**Loc:** T. 27 N., R. 12 E., at the head of Beckler R., Index dist. **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, pyrite. **Ref:** 14, p. 16.

**Bell and Crown (73)**

**Loc:** Sec. 30, (30-10E), on the divide at E. Fk. of Bender Cr. about 1 mi. S. of Silverton. **Access:** Trail up Bender Cr. **Prop:** 17 claims. **Ore:** Copper, gold, silver, lead. **Ore min:** Chalcopryrite, galena, pyrite. **Gangue:** Quartz. **Deposit:** Main vein is from 8 to 30 ft. wide in porphyry and slate. Width of ore av. about 12 ft., chiefly on hanging wall. A cross vein 12 ft. wide carries 6 ft. of ore. 3 other small veins with 2 and 3 ft. of ore. **Assays:** 10.5% Cu, \$8 in Au, Ag. High-grade ore runs as much as \$30 per ton. **Ref:** 14, p. 41. 63, p. 19.

**Big Bear and Butte (26)**

(see under gold)

**Big Copper (77)**

**Loc:** NE¼ sec. 4, (29-10E), on S. side of Hall Peak, Sultan dist. **Prop:** 6 claims. **Ore:** Copper, cobalt, gold, silver. **Ref:** 14, p. 47. 63, p. 24.

**Big Raymond (120)**

(see under gold)

**Bitter Creek (188)**

**Loc:** Sec. 11, (27-10E), about 4½ mi. NE. of Index on Bitter Cr. **Elev:** 3,300 ft. **Access:** Trail up Bitter Cr. **Prop:** 6 claims: Wonder Nos. 1 and 2, Standard, Standard Nos. 1 and 2, Maud. **Owner:** Bitter Creek Mining & Milling Co. (1912). **Ore:** Copper. **Ore min:** Bornite, chalcopryrite, pyrite, hematite. **Gangue:** Crushed and altered granodiorite. **Deposit:** Mineral-

ized shear zone 2 ft. wide in granodiorite is impregnated with copper minerals. **Dev:** 200-ft. adit, 600-ft. adit. **Assays:** Av. ore is low grade. **Ref:** 14, p. 16. 172, p. 84.

**Black Hawk (174)**  
(see under gold)

**Black Hawk (56)**

**Loc:** Sec. 3, (30-9E), Silverton dist. **Prop:** 1 patented claim. **Ore:** Copper. **Ref:** 14, p. 41.

**Blackman**  
(see Doris)

**Blackstone (143)**

**Loc:** Sec. 8, (28-11E), in Hancock Gulch, Silver Cr. dist. **Ore:** Copper, silver. **Deposit:** 11-ft. vein. **Assays:** 4 oz. Ag, 9.9% Cu. **Ref:** 14, p. 29. 63, p. 32.

**Blomquist (64)**

**Loc:** E½SE¼ sec. 18, (30-7E). **Access:** ½ mi. by road and trail E. of Granite Falls. **Prop:** 20 acres of deeded land. **Owner:** A. J. Blomquist, Lake Stevens, Wash. (1946). **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, covellite, malachite, chrysocolla. **Gangue:** Quartz. **Deposit:** Shear zone 10 in. wide in granodiorite contains sparsely disseminated chalcopryrite. **Dev:** Open cut 40 ft. long. **Assays:** Picked sample assayed 4.2% Cu, 0.20 oz. Au, 1 oz. Ag. **Ref:** 158.

**Blue Bird (19)**  
(see under gold)

**Blue Rock (84)**

**Loc:** Near center sec. 11, (29-11E), on W. side of Goat Lk., Monte Cristo dist. **Prop:** 4 claims. **Ore:** Copper, gold, silver. **Ore min:** Arsenopryrite, chalcopryrite, pyrite. **Deposit:** One fracture zone carrying 3½ ft. of ore and another 5 to 20 ft. wide with some ore. **Dev:** 10-ft. shaft, 35-ft. adit. **Ref:** 14, p. 22. 63, p. 16.

**Bluebell (142)**  
(see under gold)

**Bluff (144)**  
(see under gold)

**Bon Ton (87)**

**Loc:** SE¼ sec. 14, (29-11E), 1 mi. S. of Goat Lk., Monte Cristo dist. **Prop:** 5 claims. **Ore:** Copper, gold, silver. **Ore min:** Bornite, chalcopryrite, pyrite. **Deposit:** 10- to 12-ft. fracture zone that can be traced about 650 ft. on the surface. Ore body from 4 to 8 ft. wide. **Assays:** \$16 to \$27 Au, Ag. **Ref:** 14, p. 22. 63, p. 16.

**Bonanza**  
(see Mineral Center under gold)

**Bonanza Queen (32)**

**Loc:** Secs. 7, 8, 17, and 18, (30-10E), on Deer Cr. about ½ mi. N. of Silverton. **Elev:** 3,000 ft. **Access:** 1½ mi. by trail and 2 mi. by road from Silverton, 97 mi. to smelter at Tacoma. **Prop:** 18 claims. **Owner:** B. L. Auken and R. R. Forbes, Seattle, Wash. (1953—). Bonanza Queen Mining Co. (1908-1915). M.N.R. Mining Co. (1919). P. H. Holdsworth, Seattle, Wash. (1942). **Ore:** Copper, gold, silver. **Ore min:** Pyrite, chalcopryrite, pyrrhotite, arsenopryrite, sylvanite, realgar. **Gangue:** Quartz, calcite, altered diorite. **Deposit:** 10- to 75-ft. fracture zone exposed for 3,000 ft. on the surface. Massive sulfides in lenses in shear zone in argillite. Best lens is 60 ft. long, 5 to 10 ft. wide, and has been explored to depth of 100 ft. **Dev:** 3 adits totaling 3,000 ft. and showing a depth of 1,500 ft. **Assays:** 2% to 6% Cu, 1 to 6 oz. Ag, 0.02 to 0.19 oz. Au. **Prod:** Approx. 830 tons of ore by 1918, which is reported to have av. 3.5%

Cu, 0.04 oz. Au, 2 to 3 oz. Ag. **Ref:** 14, p. 39. 33, 1908, p. 392. 63, p. 20. 88, p. 69. 91, p. 248. 97, 1919, p. 494. 114, no. 5, 1909, p. 99. 157. 158. 159, p. 136.

**Border Queen (99)**

**Loc:** NW¼ sec. 33, (29-9E). **Elev:** 1,900 ft. **Access:** In Olney Pass on Sultan Basin road. **Prop:** 1 unpatented claim. **Owner:** Richard Sykes (1942). **Ore:** Copper. **Ore min:** Pyrite and tr. of arsenopryrite and chalcopryrite. May also contain gold. **Gangue:** Silicified dike rock. **Deposit:** 2- to 4-ft. altered and silicified dike or sill in argillaceous schist. **Dev:** 2 drifts, one 37 ft., the other 45 ft. long. **Improv:** Small, recently built cabin (1942). **Ref:** 23, pp. 78-79.

**Bornite**  
(see Bangor Creek)

**Boston**

**Loc:** Darrington dist. **Owner:** Jumbo Copper Mining Co. (1922-1929). **Ore:** Copper, gold. **Ref:** 14, p. 8. 97, 1929, p. 428. 98, 1922-1926. 158.

**Broken Ridge (Silver Creek) (163)**

**Loc:** S½ sec. 18, (28-11E), Silver Cr. dist. **Elev:** 1,400 to 3,100 ft. **Access:** Graveled road up Silver Cr. **Prop:** 4 patented claims: Dewey, Northern Bell, Schley, Nugget Chief; and 17 unpatented claims. **Owner:** Rosaia Mining Co., Seattle, Wash. (1956). Fred Magnusen, Index, Wash. (1951). **Ore:** Copper, silver, gold, zinc. **Ore min:** Chalcopryrite, pyrite, bornite, sphalerite, quartz. **Gangue:** Silicified metamorphic rock, quartz. **Deposit:** Silicified and mineralized shear zones in metamorphic rocks. Moderate radioactivity in one place on Dewey claim. **Dev:** One adit several hundred ft. long, one 90 ft. long, and several open cuts. **Improv:** Cabin. **Assays:** 3.1% Cu, 3 oz. Ag, some Au. **Prod:** 1934. **Ref:** 14, p. 28. 97, 1935, p. 354. 150, p. 28. 158.

**Brown**  
(see Doris)

**Buckeye (195)**

**Loc:** SE¼ sec. 33, (27-10E), about 1 mi. W. of Halford, Index dist. **Elev:** 2,500 ft. **Access:** 1½ mi. by trail from Eagle Falls on the S. Fk. of Skykomish R. **Prop:** 16 claims and 2 millsites: Buckeye Nos. 1 to 16. **Owner:** Buckeye Copper Co. (1912). **Ore:** Copper, silver, gold. **Ore min:** Chalcopryrite, bornite, cuprite, chalcocite. **Gangue:** Quartz, calcite, crushed and altered granodiorite. **Deposit:** 2 mineralized shear zones ranging in width from mere seams to 6 ft. They are largely barren of ore except for small lenses. **Dev:** 3 adits with drifts totaling 1,500 ft., numerous open cuts. **Assays:** \$1 to \$2 Au, tr. Ag. **Prod:** Several tons of high-grade ore were packed out on horses prior to 1912 and shipped to the Tacoma smelter. **Ref:** 14, pp. 14-15. 33, 1908, p. 417. 58, p. 10. 162, pp. 88-90.

**Bullet (71)**

**Loc:** NE¼ sec. 21, (30-9E), on the mountain at mouth of Gordon Cr., Silverton dist. **Prop:** Bullet, Wad, and Hope claims. **Ore:** Copper, gold, silver. **Ore min:** Pyrite, chalcopryrite, arsenopryrite. **Deposit:** 12- to 14-ft. mineralized zone between walls of syenite and serpentine traceable for 4,500 ft. on the surface. **Dev:** 35-ft. adit. **Assays:** \$2 to \$39 Au, Cu, Ag. One sample taken across about 6 ft. of the ore showed \$15 Au, Ag. **Ref:** 14, p. 41. 63, p. 23.

**Bullion King**  
(see under gold)

**Bunker Hill**  
(see Copper Belle)

**Bunker Hill (57)**

**Loc:** Sec. 4, (30-9E), Silverton dist. **Ore:** Copper. **Ore min:** Chalcopyrite, pyrrhotite. **Deposit:** 2-ft. vein of solid sulfides. **Dev:** Adit. **Ref:** 14, p. 4. 158.

**Burns (15)**

(see under gold)

**Bush and Curry**

**Loc:** Index dist. **Ore:** Copper. **Prod:** 1916, 1917. **Ref:** 97, 1917, p. 504; 1918, p. 508.

**Butte and Big Bear**

(see Big Bear and Butte under gold)

**Calumet (106)**

(see under gold)

**Calumet (189)**

**Loc:** Secs. 11 and 12, (27-10E), on the ridge between the N. and S. branches of Bitter Cr., Index dist. **Elev:** About 4,000 ft. **Access:** Trail up Bitter Cr. **Prop:** 4 claims. **Owner:** W. S. Dewey (1912). **Ore:** Copper, zinc. **Ore min:** Chalcopyrite, pyrite, sphalerite. **Gangue:** Quartz, calcite, altered granodiorite. **Deposit:** Mineralized shear zone as much as 8 ft. wide in granodiorite. **Dev:** 100-ft. adit, 500-ft. adit, several open cuts. **Ref:** 14, pp. 16-17. 162, pp. 82-83.

**Calumet**

(see Glacier Peak)

**Caplin-Holbrooke (129)**

(see under gold)

**Cascade (Homestead) (187)**

**Loc:** Sec. 12, (27-10E) and sec. 7, (27-11E), on the S. side of Trout Cr., Index dist. **Elev:** About 2,000 ft. **Access:** 1 mi. SE. of the Sunset mine by truck and bulldozer roads. 7 mi. from railroad at Index. **Prop:** 11 claims. **Owner:** W. Proper and O. T. Majors, Index, Wash. (1942). Homestead Copper Co. (1909). Cascade Copper Co. (1926). **Ore:** Copper, gold, silver. **Ore min:** Chalcopyrite, bornite, pyrite. **Gangue:** Quartz. **Deposit:** Mineralized shear zones in granodiorite. A 1-ft. vein consists of slightly mineralized nodules and stringers in a shear zone. **Dev:** Several short adits and a 310-ft. crosscut that fails to cut the ore. **Assays:** Ore is low grade. **Ref:** 14, p. 17. 58, p. 30. 98, 1922-1926. 111, p. 5. 112, p. 183. 130, p. 79. 158. 162, p. 79.

**Champion (139)**

(see under gold)

**Charlotte (180)**

**Loc:** SW  $\frac{1}{4}$  sec. 35, (28-10E), about  $\frac{1}{2}$  mi. SW. of the Ethel mine on NW. side of N. Fk. of Skykomish R., Index dist. **Elev:** 1,000 ft. **Access:** Reached by trail from Curry's ranch. **Owner:** Riley Curry, Index, Wash. (1942). **Ore:** Copper, gold, silver. **Ore min:** Chalcopyrite, pyrite, chalcocite. **Deposit:** Small lenses of ore along a shear zone in granodiorite. Ore body 20 ft. in dia. with a max. width of 6 ft. About 1 carload of ore in sight. **Dev:** 150-ft. drift, 20-ft. drift, 35-ft. drift, and short winze. **Prod:** 2 carloads of high-grade ore. **Ref:** 14, p. 15. 158.

**Chatman**

(see Jerry Chatman)

**Chickamun**

(see Forest-Chickamun)

**Clara Thompson**

(see Jasperson under gold)

**Cleveland (45)**

(see also Ore Recoveries)

**Loc:** SW  $\frac{1}{4}$  sec. 20, (30-10E), adjoining the Copper Independent property, Silverton dist. **Access:** Trail. **Prop:** 4 claims. **Owner:** Ore Recoveries Corp. (1941). Virginia-Agenda Co. (1922-1930). **Ore:** Copper, gold, silver, lead. **Ore min:** Pyrite, chalcopyrite, arsenopyrite, galena. **Deposit:** Intersecting veins with several ore bodies 2 ft. wide. **Dev:** 72-ft. adit. **Assays:** \$29 Cu, Au, Ag. **Ref:** 14, pp. 41-42. 46, pp. 164-165. 63, p. 18. 97, 1930, p. 675. 98, 1922-1926. 114, no. 5, 1909.

**Cliff (58)**

**Loc:** Sec. 3, (30-9E), near Marten Cr., Silverton dist. **Elev:** 3,925 ft. **Ore:** Copper. **Ore min:** Chalcopyrite, marcasite. **Deposit:** Several 2- to 4-in. stringers of fairly well mineralized rock and quartz in granodiorite. **Dev:** 30-ft. adit. **Ref:** 14, p. 42. 158.

**Colts (33)**

**Loc:** SW  $\frac{1}{4}$  sec. 7, (30-10E), on a fork of Deer Cr., Silverton dist. **Access:**  $\frac{1}{2}$  mi. from wagon road up Deer Cr. **Prop:** 4 claims. **Ore:** Copper, silver, gold. **Ore min:** Chalcopyrite. **Deposit:** Vein or mineralized zone containing 3 ft. of rich ore and 7 ft. of concentrating ore. **Dev:** 14-ft. and 16-ft. adits on the vein and a 55-ft. crosscut that failed to contact the ore. **Assays:** 26% Cu, 18  $\frac{1}{2}$  oz. Ag, \$3.40 Au for the high-grade ore. **Ref:** 14, p. 42. 63, p. 21.

**Columbia Mountain**

(see under antimony)

**Commercial (178)**

**Loc:** SE  $\frac{1}{4}$  sec. 32, (28-11E), Index dist. **Ore:** Copper, gold. **Ore min:** Chalcopyrite, pyrite. **Deposit:** 4-ft. vein traceable for 300 ft. on the surface. **Assays:** \$12 to \$20 Au, Cu. **Ref:** 63, p. 34.

**Commonwealth**

(see Jasperson under gold)

**Commonwealth**

(see under gold)

**Consolidated**

(see under gold)

**Cooperative (Howard) (173)**

**Loc:** SE  $\frac{1}{4}$  sec. 29, (28-11E) and secs. 4 and 5, (27-11E). **Access:** Trail up Howard Cr. from road on N. Fk. of Skykomish R. **Prop:** 16 claims. **Owner:** Cooperative Mining Syndicate (1912). **Ore:** Copper, gold, silver, lead, zinc. **Ore min:** Chalcopyrite, bornite, pyrite. **Deposit:** Mineralized shear zones in quartzite and granodiorite. **Dev:** Several adits aggregating about 1,500 ft., an old shaft of unknown depth, and several open cuts. **Assays:** Samples from old shaft assayed \$1 to \$6 Au. **Ref:** 14, p. 17. 63, p. 33. 162, pp. 79-80.

**Copper**

(see Merchant)

**Copper Belle (Bunker Hill) (160)**

**Loc:** Secs. 1, 2, 11, and 12, (27-9E), on S. slope of the mountain NE. of the old station of Reiter, Index dist. **Elev:** 1,500 ft. **Access:** 1 mi. by trail N. of Reiter. **Prop:** 18 patented claims. **Owner:** Wiatrak Mining & Developing Co., Inc., Seattle, Wash. (1955—). Bunker Hill Mining & Milling Co. (1902-1905). Copper Belle Mining Co. (1907). Western Copper Mining Co. (1918-1926). Shamrock Mining Co. (1927). **Ore:** Copper, gold, silver, tungsten. **Ore min:** Chalcopyrite, pyrite, bornite, magnetite, hematite. **Gangue:** Quartz, calcite, crushed and altered granodiorite. **Deposit:** Lens-shaped bodies of ore in shear zones in granodiorite. Main ore body was a lens 30 ft. wide. **Dev:** Main adit 2,000 ft. long with drifts and stopes. 7 other shorter

adits. Considerable diamond drilling. **Improv:** 200-ton mill under construction at Gold Bar (1955). **Assays:** Av. said to be 8% Cu, \$2.00 Ag, tr. Au. **Prod:** Several hundred lb. of copper matte prior to 1910. **Ref:** 7-A, p. 18. 14, p. 15. 33, 1907, p. 400; 1908, p. 423. 88, p. 80. 91, p. 243. 97, 1900, p. 337; 1906, p. 367; 1908, p. 580. 98, 1918-1926. 100, 1900, p. 82. 104, 12/15/27, p. 32. 105, no. 10, 1905, p. 160; no. 4, 1908, p. 111. 112, p. 211. 114, no. 6, 1906, p. 79; no. 5, 1909, p. 110. 129, pp. 290-291. 158. 159, p. 135. 162, pp. 90-92.

#### Copper Chief (145)

**Loc:** NW¼ sec. 7, (28-11E), on W. side of Silver Cr. **Prop:** 4 claims. **Owner:** Copper Chief Mining Co. (1901-1918). **Ore:** Copper, gold, silver, lead. **Ore min:** Chalcopryrite, galena, arsenopyrite. **Deposit:** 8-ft. vein. **Dev:** 320-ft. adit. **Assays:** Av. \$24 Cu, Au, Ag. **Ref:** 14, p. 30. 33, 1907, p. 511. 88, p. 75. 98, 1918, p. 73.

#### Copper Cliff

(see under gold)

#### Copper King (184)

**Loc:** NW¼ sec. 1, (27-10E), 475 ft. N. of Sunset lode, Index dist. **Prop:** 1 patented claim. **Owner:** F. M. Jordan, Seattle, Wash. **Ore:** Copper. **Ore min:** Black copper oxide, bornite, chalcopryrite, malachite. **Deposit:** Similar to Sunset. **Prod:** Has produced. **Ref:** 129, pp. 287-288. 158.

#### Copper Prince (46)

(see under gold)

#### Copper Queen (69)

**Loc:** Sec. 13, (30-9E), N. of Silverton. **Elev.** 4,550 ft. **Ore:** Copper, gold. **Ore min:** Pyrrhotite. **Deposit:** Mineralization in metasediments as masses and pods. **Dev:** Short adit. **Assays:** Less than 1% Cu, 40¢ Au. **Ref:** 14, p. 42. 158.

#### Copperhead (34)

**Loc:** SW¼ sec. 18, (30-10E), on Long Mtn., Silverton dist. **Prop:** 19 claims. **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite. **Deposit:** Vein ranges from 2 in. to 5 ft. in width. Sixteen smaller veins and stringers known to occur. **Assays:** \$10 to \$70 per ton. **Ref:** 14, p. 42. 63, p. 19.

#### Courtney (10)

**Loc:** SW¼ sec. 27, (32-9E), on Jumbo Mtn., Darrington dist. **Ore:** Copper, silver, gold, lead. **Deposit:** 3-ft. vein. **Dev:** 10-ft. adit. **Assays:** \$8.50 Au, 14% Cu, 15 oz. Ag, 4% Pb. **Ref:** 14, p. 8. 63, p. 51.

#### Covered Wagon (164)

**Loc:** NE¼ sec. 19, (28-11E), on W. side of Silver Cr., ½ mi. N. of Galena. **Owner:** Lawrence V. Whitfield, Monroe, Wash. (1952). Formerly owned by C. F. Armstrong, Index, Wash. **Ore:** Copper, gold. **Ref:** 133, p. 32. 158.

#### Crown

(see Bell and Crown)

#### Curry

(see Bush and Curry)

#### Dahl

(see Eclipse under gold)

#### Damm

**Loc:** T. 31 N., R. 15 E., on Miners Ridge at head of Suitttle R., Glacier Peak dist. **Elev:** 5,500 to 6,500 ft. **Access:** Reached by road and trail up Railroad Cr. or up Suitttle R. **Prop:** Covers a length of about 2 mi. **Owner:** Damm brothers, Seattle, Wash. **Ore:** Copper, silver, gold. **Deposit:** Mineralized shear zone in granitic country rock. Shear zone is 600 ft. wide and exposed for a length of 1,500 ft. to a depth of more than 1,000

ft. **Dev:** Open cuts and several adits in ore. **Improv:** Small cabin. **Assays:** \$1 to \$1.50 Au, 3 to 5 oz. Ag. 3% to 3.5% Cu. **Note:** Probably this is an alternate name for the Glacier Peak property. **Ref:** 14, p. 12. 158.

#### Darrington

(see Gold Mountain)

#### Darrington (Elwell-Darrington)

(see Elwell-Darrington under gold)

#### Deer Lake (25)

**Loc:** SW¼ sec. 36, (31-9E), on the mountains overlooking Deer Lk., Silverton dist. **Prop:** 10 claims. **Ore:** Copper. **Ore min:** Chalcopryrite. **Deposit:** 4-ft. vein, 6-ft. vein. **Dev:** Two 60-ft. adits, 40-ft. adit, and two crosscuts of unknown length. **Ref:** 14, p. 42. 63, p. 21.

#### Del Campo

(see under gold)

#### Delta

**Loc:** Silver Cr. dist. **Owner:** Judge Denny, Everett, Wash. (1892). **Ore:** Copper, lead, gold, silver. **Ore min:** Galena, chalcopryrite. **Gangue:** Quartz. **Deposit:** 5-ft. vein. **Ref:** 13, p. 159. 14, p. 31.

#### Dewey (162)

(see under gold)

#### Diamond Hitch (124)

**Loc:** Sec. 31, (29-11E), on W. Fk. of Silver Cr. **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, pyrite. **Deposit:** 4 in. of ore along a shear zone. **Dev:** 45-ft. adit. **Ref:** 14, p. 31. 63, p. 30.

#### Doris (Blackman, Brown) (112)

**Loc:** E½ sec. 34 and W½ sec. 35, (29-10E), Sultan dist. **Elev:** 3,000 to 3,700 ft. **Prop:** 5 unpatented claims. **Owner:** Kelly Summerfield (1943). Western Metals Corp. (1928). **Ore:** Copper, silver. **Ore min:** Chalcopryrite, pyrite, a little sphalerite, small amount scheelite. **Gangue:** Quartz, brecciated metamorphics. **Deposit:** Mineralized fault zones 1 to 4 ft. wide in quartzite and hornfels. **Dev:** 250-ft. drift, 200-ft. crosscut, and two 6-ft. drifts. **Ref:** 23, pp. 60-62. 106, 9/1/28; 9/17/28, pp. 5-6. 158.

#### Drum Lummond (59)

**Loc:** Sec. 4, (30-9E), Silverton dist. **Prop:** 1 patented claim. **Ore:** Copper. **Ref:** 14, p. 43.

#### Dry Creek

(see under gold)

#### Eclipse (43)

(see under gold)

#### Edison (121)

(see under gold)

#### El Dorado (86)

**Loc:** NW¼ sec. 13, (29-11E), ¾ mi. SE. of Goat Lk., Monte Cristo dist. **Ore:** Copper, silver, gold. **Ore min:** Chalcopryrite, pyrite. **Deposit:** Narrow mineralized fracture. **Dev:** Short adit. **Assays:** \$6 to \$21 Au, \$2 to \$7 Ag, as high as 21% Cu. **Ref:** 14, p. 23. 63, p. 15.

#### Eldred (81)

**Loc:** Sec. 11, (29-10E), at headwaters of Stilaguamish R. **Access:** ½ mi. from the main Sunrise trail. **Prop:** 1 claim. **Owner:** R. H. Spurlock and J. Sahlborn, Marysville, Wash. (1942). **Ore:** Copper, tungsten. **Ore min:** Pyrite, arsenopyrite, minor chalcopryrite and scheelite. **Deposit:** Quartz vein 12 to 16 in. wide in argillite and conglomerate. **Dev:** 40-ft. drift with a 15-ft. crosscut. **Ref:** 158.



**Elmo**

(see Gold Bar and Elmo under lead)

**Elwell-Darrington (11)**

(see under gold)

**Empire**

(see Merchant)

**Ethel (Ethel Consolidated) (181)**

**Loc:** Secs. 34 and 35, (28-10E), about 5½ mi. NE. of Index on S. side of Excelsior Cr. **Elev:** 1,250 to 2,100 ft. **Access:** Reached by trail from Curry's ranch. **Prop:** At least 13 claims. **Owner:** Dr. George Warren, Seattle, Wash. (1942). Ethel Consolidated Mines Co. (1902-1907, 1908-1918). Ethel Copper Mining Co. (1907). **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, bornite, chalcocite, pyrite. **Gangue:** Quartz, calcite, fluorite, decomposed granodiorite. **Deposit:** Shear zone in granodiorite is a few in. to 27 ft. in width and carries a little ore. **Dev:** 4 adits aggregating 4,000 ft. with drifts and stopes. Winze about 250 ft. in depth. **Assays:** Ore av. about 4% Cu, 8 oz. Ag. **Prod:** About 400 tons. **Ref:** 14, p. 15. 33, 1907, p. 590; 1908, p. 673. 88, pp. 78-79. 97, 1907, 1908, 1918. 98, 1918, p. 84. 114, no. 4, 1907, p. 55; no. 5, 1907, p. 108. 158. 159, p. 135. 162, pp. 74-76.

**Ethel Consolidated**

(see Ethel)

**Eureka (37)**

**Loc:** SE¼ sec. 14, (30-10E), on the divide between Perry and Falls Creeks, Silverton dist. **Prop:** 15 claims. **Owner:** Ore Recoveries Corp. leasing from Lambda Chemical Corp. (1941). **Ore:** Copper, silver, gold, lead. **Ore min:** Chalcopryrite, galena, tetrahedrite. **Deposit:** 2 veins. **Dev:** 7 adits up to 75 ft. in length. **Assays:** 4 to 36 oz. Ag, \$1.00 Au. **Ref:** 14, p. 43. 46, pp. 164-165. 63, p. 22.

**Everett (47)**

**Loc:** NE¼ sec. 20, (30-10E), Silverton dist. **Prop:** 3 claims. **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, pyrite, tetrahedrite. **Deposit:** 3 veins, 6 to 14 in. wide. **Ref:** 14, p. 43. 63, p. 18.

**Evergreen (165)**

**Loc:** NW¼ sec. 20, (28-11E), on E. side of Silver Cr. just above Galena. **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, pyrite. **Deposit:** 16- to 20-ft. vein carrying from 2 to 4 ft. of ore. **Dev:** 30-ft. adit with 75 ft. of drifts. **Assays:** \$5 to \$65 Au, 3% to 27% Cu. **Ref:** 13, p. 158. 14, pp. 31-32. 63, p. 32.

**Fanny (42)**

(see under gold)

**Feldt (72)**

(see under silver)

**Florence-Rae (185)**

**Loc:** Sec. 2, (27-10E), on the ridge between Trout and Bitter Creeks, Index dist. **Elev:** 1,780 ft. **Access:** Adjacent to road on SE. side of N. Fk. of Skykomish R. **Prop:** 10 claims. **Owner:** Cascade Mining Co. (1907-1924). Florence-Rae Lumber, Land & Development Co. (1912). **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, bornite, pyrite, hematite. **Gangue:** Crushed and altered granodiorite. **Deposit:** Slightly mineralized shear zone in granodiorite. **Dev:** 150-ft. adit and several open cuts. **Assays:** 2% to 50% Fe, 2 oz. Ag, tr. Au. **Ref:** 14, p. 17. 97, 1917, p. 504; 1918, p. 508. 98, 1918-1925. 116, no. 1, 1907, p. 17; no. 3, 1908, p. 60. 158. 162, pp. 83-84.

**Florence Rae (Rudebeck-Florence Rae) (107)**

**Loc:** Secs. 26 and 27, (29-10E). **Elev:** 4,450 ft. **Access:** End of Sultan Basin road is at E. end of property. **Prop:** 14 unpatented claims. **Owner:** Harry Rudebeck, Index, Wash. (1951). North Coast Copper Co. (1917). Miners Smelting & Refining Co. (1934). Florence Rae Mining Co. (1936). Kromona Mines Corp. (1940-1941). **Ore:** Copper, silver, gold, nickel. **Ore min:** Chalcopryrite, pyrite, pyrrhotite, sphalerite, magnetite, little galena, specular hematite, chromite, scheelite. **Gangue:** Quartz, calcite, amphibole, some serpentine. **Deposit:** One lens of chromite ore 4 by 5 ft., other smaller lenses. 4 principal vein systems: Margaret Moshier, Lambert, Copper King, and Junie, in metamorphics, peridotite, and quartz diorite. **Dev:** 1,400 ft. of underground workings on Moshier, 170-ft. drift on Junie. **Assays:** 505 tons shipped 1938-1941 av. 0.01 oz. Au, 2.36 oz. Ag, 12.40% Cu, 0.8% Zn, 0.07% Ni. **Prod:** 606.11 tons crude ore in periods 1918-1919, 1937-1941. **Ref:** 14, pp. 46-47. 23, pp. 55-60. 68, p. 8. 97, 1938-1941. 104, 4/30/34, pp. 21-22; 12/15/36, p. 27. 158.

**Foggy (Alleghany, Penn) (88)**

**Loc:** SW¼SW¼ sec. 13, (29-11E), on the NE. slope of Cadet Peak, Monte Cristo dist. **Elev:** 5,500 ft. **Access:** Trail up Elliot Cr. from the Sauk R. road. **Prop:** 3 patented claims: Foggy Lode, New York, 95. **Owner:** Dr. W. J. Collings, Renton, Wash. (1949). **Ore:** Copper, gold, silver, lead, zinc, antimony, arsenic. **Ore min:** Arsenopryrite, pyrite, chalcopryrite, galena, sphalerite, stibnite, realgar. **Gangue:** Quartz. **Deposit:** A partially mineralized fracture zone can be traced for 5,000 ft. on the surface. Surface ores are galena, sphalerite, chalcopryrite, stibnite, and realgar. Ores at depths of more than 200 ft. are pyrite and arsenopryrite. **Dev:** More than 1,000 ft. of adit is reported to give a depth of 1,000 ft. below the surface. **Assays:** Av. 0.2 oz. Au, 8 oz. Ag, 3% to 5% Zn, 3% to 4% Pb, 3.15% As, 5.5% Sb. **Prod:** Amount not known. **Ref:** 14, p. 20. 63, p. 15. 132, pp. 134-135. 149, pp. 816, 842. 158.

**Forest-Chickamun (20)**

**Loc:** Darrington dist., a short distance from the town of Darrington. Possibly in sec. 24, (32-9E). **Owner:** North Coast Mining & Reduction Co. (1908-1918). New Century Exploration and Reduction Co. (1907). **Ore:** Copper **Ore min:** Arsenopryrite, chalcopryrite, pyrite. **Gangue:** Quartz. **Deposit:** Small mineralized quartz veins filling fissures in sheared argillite. Zone of fissuring av. 3½ ft. in width. Mineralization sparse. **Dev:** Adit consists of a crosscut and two drifts. **Ref:** 14, p. 8. 33, 1907, p. 854; 1908, p. 1053. 98, 1918, pp. 113, 115. 159, p. 134.

**Forest Hope (16)**

**Loc:** SE¼ sec. 18, (32-10E), Darrington dist. **Prop:** 3 claims. **Ore:** Copper, gold, silver, mercury. **Ore min:** Cinnabar, native mercury. **Deposit:** 8 ft. of ore for 1,000 ft. on the surface. This splits into 3 veins, 4, 5, and 6 ft. wide. **Assays:** \$6 to \$36 Au, tr. to 18 oz. Ag, 10% to 18% Cu. **Ref:** 14, p. 8. 63, p. 52.

**"48-55" (Garnet, Vesper Peak) (79)**

**Loc:** Center sec. 9, (29-10E), 300 ft. SW. of ridge crest. **Elev:** 5,500 ft. **Access:** No trail. Reached by hiking to summit of Vesper Peak, thence about ½ mi. NW. along ridge toward Little Chief Peak. **Prop:** 1 unpatented claim. **Owner:** P. E. Crane, Snohomish, Wash. (1913). **Ore:** Nonmetallics constitute principal value. **Ore min:** Small amounts chalcopryrite, arsenopryrite. **Gangue:** Calcite, grossularite, augite, diopside, epidote, prehnite, scapolite (?), vesuvianite, hillebrandite (?). **Deposit:** Limestone lens altered by contact metamorphism forms body 70 ft. long and 50 ft. wide. **Dev:** A few shallow cuts. **Ref:** 23, p. 70.

**"45" (74)**

(see under silver)

**Four Brothers (41)**

**Loc:** NE¼ sec. 19, (30-10E), W. of the Helena group, Silverton dist. **Prop:** Group of claims. **Owner:** Copper-Independent Consolidated Mining Co. (1901-1908). **Ore:** Copper. **Dev:** 130 ft. of adits. **Ref:** 14, p. 43. 33, 1907, p. 518; 1908, p. 557. 88, p. 70.

**Fox**

**Loc:** Near Silverton on Long Mtn. **Access:** Easily accessible. **Ore:** Copper. **Deposit:** Body of pyrrhotite 30 ft. or more wide, 2,000 to 3,000 ft. long. **Assays:** Less than 0.75% Cu. **Ref:** 14, p. 43. 158.

**Garnet**

(see "48-55")

**Glacier Peak (Calumet) (31)**

**Loc:** Sec. 10, (31-15E), on a steep ridge on N. side of Miners Cr., Glacier Peak dist. **Elev:** 5,300 to 6,200 ft., near crest of Cascade Mtns. **Access:** 51 mi. from railroad at Darrington, up Suitttle R., 12 mi. of which is by trail. 26 mi. from Lucerne up Railroad Cr., 12 mi. of which is by road. **Prop:** 32 claims and a millsite. 12 patented claims: Annie, Beatrice, Calumet, Discovery, Hecla, Maggie, Mary, Morning Star, Prince, S.A.W., Raymond, Viva. **Owner:** Glacier Peak Mining & Smelting Co. (1900—), leasing to Bear Creek Mining Co., Spokane, Wash. (1953—). Vogelsang Bros. (Minerals Separation Co.) (1917). American Metals Co. (1917-1918). International Smelting & Refining Co. (1943). Hanna Coal & Ore Corp., Cleveland, Ohio (1937-1952). **Ore:** Copper, molybdenum, gold, silver. **Ore min:** Molybdenite, chalcopryrite, pyrite, pyrrhotite, enargite, arsenopyrite, sphalerite, galena, scheelite, malachite, chalcocite, cuprite, native copper. **Gangue:** Quartz, mica, carbonates, tourmaline, ilmenite, kaolinite, talc. **Deposit:** Closely spaced joints in quartz diorite are filled with quartz veinlets mineralized with chalcopryrite and molybdenite. The ore minerals also replace ferromagnesian minerals in the rocks. Copper is distributed uniformly but molybdenum erratically. 2 similar ore bodies are 1,000 ft. apart, and adjacent to the main ore body is a massive, generally barren, quartz plug, which contains a few high-grade areas. The main ore body is at least 600 ft. by 350 ft. in cross section and 400 ft. deep, and the NE, ore body is thought to be similar but smaller. It is egg shaped in cross section and is known to extend to a 500-ft. depth, but the lower boundary is not known. **Dev:** 6 adits and an open cut. One adit 450 ft. long, the others 100 to 150 ft. long. Diamond drill holes: 1,984 ft. in 3 holes by American Metals Co., 19,079 ft. in 36 holes by Hanna Coal & Ore Corp., 6,822 ft. by International Smelting & Refining Co., 6,800 ft. by Bear Creek Mining Co. **Assays:** More than 1,000 assays indicate several million tons of ore containing about 1% Cu, 0.1% MoS<sub>2</sub>, plus about twice as much ore containing about 0.6% Cu, 0.03% MoS<sub>2</sub>. Av. values of 0.0022 oz. Au, 0.283 oz. Ag have been determined. **Ref:** 14, p. 12. 22, p. 6. 68, p. 10. 97, 1929, p. 428. 98, 1926, p. 1581. 105, 1912, p. 711. 108, 6/56, pp. 60-61. 112, p. 179. 116, 1910, pp. 62-64. 133-B, pp. 63-64. 158.

**Glengarry**

(see under silver)

**Gold Bar (125)**

**Loc:** Sec. 31, (29-11E), Silver Cr. dist. **Ore:** Copper, lead, gold, silver. **Ore min:** Chalcopryrite, galena, pyrite. **Ref:** 14, p. 32. 63, p. 30.

**Gold Bar and Elmo**

(see under lead)

**Gold Eagle (122)**

(see under gold)

**Gold Mountain (Darrington) (22)**

**Loc:** Sec. 31, (32-10E), on Gold Mtn., on N. side of Sauk R. opposite mouth of Clear Cr. **Access:** Truck road. **Prop:** 8 claims. **Owner:** Mr. Cornelius and associates, Mount Vernon, Wash. (1942). **Ore:** Copper, silver, gold. **Ore min:** Chalcopryrite, tetrahedrite (?), pyrrhotite, and minor amounts of sphalerite and galena. **Deposit:** Quartz veins in schist. One vein is traceable for 125 ft. and has a max. width of 8 ft. It narrows to a width of 1 ft. in a short distance, however. 2 other veins are about 1 ft. wide. **Dev:** Crosscut with 125 ft. of drift and another old adit in barren rock. **Assays:** \$18 to \$36 Au, tr. to 18 oz. Ag, \$18 to \$32 Cu. **Ref:** 14, p. 8. 58, p. 26. 63, p. 52. 158.

**Golden Chord (68)**

(see under gold)

**Golden Eagle (110)**

(see under molybdenum)

**Good Hope (130)**

(see under gold)

**Good Luck (172)**

**Loc:** SW¼ sec. 21, (28-11E), Index dist. **Access:** 11 mi. by road from railroad at Index. **Prop:** 4 or more claims. **Owner:** E. S. Turner, Tom Swaboda, and Fred Simmerer (1949). Dr. James Brannon and associates, Index, Wash. (1943). **Ore:** Copper. **Deposit:** Schist, quartzite, and granite, in which is a quartz pegmatite dike containing sparse mineralization. Dike can be traced for 500 ft. and is 50 to 100 ft. thick, but only a very small part of this is ore. **Dev:** Open cut. **Ref:** 68, p. 10. 157.

**Granite Mountain**

**Loc:** On Marble Mtn., Silverton dist. **Ore:** Copper, gold. **Ore min:** Chalcopryrite, pyrite. **Deposit:** Mineralized shear zone 16 to 40 ft. wide in porphyry. **Assays:** \$6.40 to \$12 per ton. **Ref:** 14, p. 44. 63, p. 19.

**Gray Eagle (161)**

**Loc:** Sec. 17, (28-11E), on E. side of Silver Cr. **Ore:** Copper, silver, lead. **Ore min:** Galena, chalcopryrite. **Deposit:** Vein. **Dev:** One crosscut adit. **Ref:** 14, p. 32. 63, p. 32.

**Great Northern (98)**

(see under gold)

**Great Scott (135)**

(see under gold)

**Green Crown (2)**

**Loc:** SE¼ sec. 31, (32-9E), on Whitehorse Mtn., Darrington dist. **Prop:** 2 claims. **Ore:** Copper, silver, gold. **Ore min:** Chalcopryrite. **Deposit:** Shear zone 100 ft. wide in which are mineralized quartz veins as much as 10 in. wide. **Assays:** \$100 Au, 32 oz. Ag, 26% to 42% Cu. **Ref:** 14, p. 9. 63, p. 51.

**Grizzly**

**Loc:** On Clear Cr. beyond the Helena mine, Silverton dist. **Prop:** 4 claims. **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, bornite. **Deposit:** 2 wide veins and 1 narrow vein with 24 in. of ore. **Dev:** Adit and 18-ft. shaft on narrow vein. **Assays:** \$50 Au, Ag, Cu. **Ref:** 14, p. 44. 63, p. 21.

**Gunn Peak (190)**

**Loc:** Sec. 14, (27-10E), near the headwaters of Canyon Cr., 3½ mi. NE. of Index. **Elev:** 2,500 ft. **Access:** Trail. **Prop:** 5 claims. **Owner:** Gunn Peak Copper Mining Co. (1902-1912). Index-Bornite Copper Mining Co. (1908). **Ore:** Copper, silver, gold. **Ore min:** Chalcopryrite, bornite. **Gangue:** Crushed granodiorite. **Deposit:** Nearly vertical 3-ft. shear zone in granodi-

orite is slightly mineralized. **Dev:** 455-ft. adit, 10-ft. adit. **Assays:** Av. samples said to run 11.4% Cu, \$1.92 Ag, tr. Au. **Ref:** 14, p. 17. 33, 1907, p. 660; 1908, pp. 768, 809. 88, p. 82. 114, no. 5, 1909. 162, pp. 85-86.

### Hammond

(see Keystone)

### Hancock (123)

**Loc:** Sec. 31, (29-11E), ½ mi. N. of Mineral City, Silver Cr. dist. **Ore:** Copper, gold, silver, nickel, cobalt. **Ore min:** Chalcopryrite, pyrite. **Deposit:** 15- to 30-ft. vein with 1½ to 3 ft. of ore. **Dev:** 40-ft. adit. **Ref:** 14, p. 33. 63, p. 29.

### Hannah (24)

**Loc:** NW¼ sec. 31, (31-10E), Silverton dist. **Prop:** 8 claims. **Ore:** Copper. **Dev:** 40-ft. adit. **Assays:** \$10 Cu. **Ref:** 14, p. 44. 63, p. 20.

### Hannah (3)

**Loc:** NE¼ sec. 32, (32-9E), on Whitehorse Mtn., Darrington dist. **Prop:** 5 claims. **Ore:** Copper, gold, silver. **Deposit:** 3 ft. of ore in granite country rock. **Assays:** \$19.85 Au, 41 oz. Ag, 30% Cu. **Ref:** 14, p. 9. 63, p. 51.

### Hard Pass (113)

**Loc:** SE¼ sec. 36, (29-10E), on W. side of Sheep Gap Mtn., Sultan dist. **Prop:** 1 claim. **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, tetrahedrite. **Dev:** 10-ft. adit. **Ref:** 14, p. 48. 63, p. 25.

### Hecla (30)

**Loc:** Sec. 2, (30-9E), at the head of Marten Cr., Silverton dist. **Access:** About 5½ mi. from Silverton by trail and road. **Ore:** Copper, gold, silver. **Ore min:** Pyrite, chalcopryrite, marcasite. **Gangue:** Quartz. **Deposit:** Slightly mineralized joints in granodiorite. Small amounts of the ore minerals and quartz. **Dev:** Open cuts. **Ref:** 14, p. 44.

### Helena (197)

**Loc:** NW¼ sec. 16, (27-10E), ½ mi. NE. of Index. **Elev:** 2,500 ft. **Access:** Trail. **Prop:** 2 claims: Tillicum, Tillicum Hill. **Owner:** William Cornwall, Index, Wash. (1912). **Ore:** Copper. **Ore min:** Chalcopryrite, bornite, pyrite. **Gangue:** Quartz, calcite altered granodiorite. **Deposit:** 4-ft. mineralized shear zone in granodiorite consists of 1-in. sulfide bands alternating with altered granodiorite. **Dev:** 3 short adits aggregating 255 ft. **Ref:** 14, p. 17. 162, p. 86.

### Helena (23)

**Loc:** SW¼ sec. 30, (31-10E), about 5 mi. N. of Silverton, on the divide between Deer and Clear Creeks. **Access:** Old wagon road from Silverton to St. Louis mine, thence by trail along the divide. **Prop:** 6 claims. **Owner:** Deer Creek Gold & Copper Mining Co. (1902-1907). **Ore:** Copper, gold, silver. **Ore min:** Pyrite, chalcopryrite. **Gangue:** Sheared granite, quartz. **Deposit:** At least 2 sulfide-bearing quartz veins in shear zones in granite. Large low-grade bodies of ore. **Dev:** Main adit 124 ft. long with 125 ft. of drifts. Another adit 1,000 ft. lower. **Assays:** \$19 to \$32 per ton. **Prod:** 150 tons shipped to Tacoma smelter. **Ref:** 14, p. 40. 33, 1907, p. 554. 63, pp. 19-20. 88, pp. 69-70.

### Helena and Sadie (114)

**Loc:** SW¼ sec. 36, (29-10E), on W. side of Sheep Gap Mtn., Sultan dist. **Prop:** 2 claims. **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite. **Deposit:** 3 parallel shear zones in syenite, 2 of which are 30 in. wide with 18 in. of ore, and the third is 6 ft. wide with 40 in. of ore. The large zone is traceable for 2,000 ft. on the surface and the middle one for 300 ft. **Dev:**

Several short adits. **Assays:** 16% to 20% Cu, \$8 to \$10 Au. **Ref:** 14, p. 48. 63, p. 25.

### Hicks

(see Sultan King)

### Highland (5)

**Loc:** Sec. 3, (31-9E), near the headwaters of Buckeye Cr. on White Horse Mtn., Darrington dist. **Prop:** 5 claims. **Ore:** Copper, gold, silver. **Deposit:** 18 in. of ore. **Assays:** \$20 Au, 15 to 40 oz. Ag, 18% Cu. **Ref:** 14, p. 9. 63, p. 51.

### J. J. Hill

(see under gold)

### Holbrooke

(see Caplin-Holbrooke under gold)

### Homestead

(see Cascade)

### Hoodoo (48)

(see also Ore Recoveries)

**Loc:** SE¼ sec. 20, (30-10E), on Hoodoo Gulch, Silverton dist. **Access:** Wagon road ¾ mi. from the old railroad grade. **Prop:** 7 claims and 6 millsites. **Owner:** Ore Recoveries Corp. (1941). Stilaguamish & Sultan Mining Co. (1902-1918). **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, pyrite, pyrrhotite, stannite. **Gangue:** Quartz, calcite, country rock. **Deposit:** Veins in conglomerate and slate. **Dev:** 420-ft. main adit and shorter adits totaling 200 ft. in length. **Assays:** \$20 Cu, Ag, Au. **Ref:** 14, p. 44. 33, 1907, p. 1051. 46, pp. 164-165. 63, p. 18. 88, p. 66. 98, 1918, p. 136.

### Hope (138)

(see under gold)

### Horseshoe and Treasure Box (111)

(see under gold)

### Howard

(see Cooperative)

### Hunter (6)

**Loc:** NW¼ sec. 34, (32-9E), on Jumbo Mtn., Darrington dist. **Prop:** 2 claims. **Owner:** Messrs. Burns and Neste (1901). **Ore:** Copper, silver, lead, gold. **Ore min:** Chalcopryrite, galena. **Deposit:** Vein 3 ft. wide carries 9 in. of ore. **Dev:** 50-ft. adit, 3 open cuts. **Assays:** \$20 Au, 8 to 40 oz. Ag, 10% Cu, 4% Pb. **Ref:** 14, p. 9. 63, p. 51. 88, p. 63.

### Hustler (82)

**Loc:** Sec. 12, (29-10E), at head of Stilaguamish R. **Prop:** 2 claims: Hustler, Hustler Extension. **Ore:** Copper, molybdenum, tungsten. **Ore min:** Chalcopryrite, pyrite, molybdenite, scheelite, arsenopyrite. **Deposit:** Quartz vein from 3 to 12 in. wide. **Dev:** 50-ft. adit, 100-ft. adit. **Ref:** 158.

### Imperial (49)

**Loc:** Sec. 20, (30-10E), about 1½ mi. E. of Silverton. **Elev:** 2,500 ft. **Prop:** 11 claims, most important of which are the Anacortes and Mountain View. **Owner:** Imperial Mining Co. (1902-1909). **Ore:** Copper, silver, gold, lead. **Ore min:** Chalcopryrite, arsenopyrite, galena. **Deposit:** Main vein is along contact of diorite and conglomerate. **Dev:** 400 ft. of development. **Assays:** Main values are in copper and silver with only a small amount of gold. **Ref:** 14, p. 44. 33, 1907, p. 688. 88, pp. 68-69. 105, 9/05, p. 183. 114, no. 5, 1909, p. 99.

### Independence (152)

**Loc:** Sec. 6, (28-11E), at Mineral City. **Access:** 14 mi. from railroad at Index. **Ore:** Copper. **Ore min:** Chalcopryrite, bornite. **Deposit:** Fissure vein in granodiorite and slate. **Assays:** Est. 3 tons selected ore had 3% Cu. **Ref:** 111, p. 5.

**Index**

(see Lake Serene)

**Index Bornite (194)**

**Loc:** Secs. 22 and 23, (27-10E), on Lewis Cr. 2½ mi. E. of Index. **Access:** 1 mi. trail up Lewis Cr. **Prop:** 2 claims: Barry, Hillside. **Owner:** Index Bornite Copper Mining Co. (1902-1917). **Ore:** Copper, silver. **Ore min:** Chalcopyrite, bornite, chalcocite. **Gangue:** Quartz, calcite, crushed granodiorite. **Deposit:** Mineralized shear zone in granodiorite. Sulfides occur as small impregnations and bands up to 4 in. wide. **Dev:** 70-ft. shaft and 2 adits aggregating 700 ft. **Assays:** 11.1% to 58.9% Cu, 3.8 to 8.6 oz. Ag. **Ref:** 14, pp. 17-18. 33, 1907, p. 689; 1908, p. 809. 58, p. 33. 88, p. 81. 114, no. 4, 1907, p. 55; no. 5, 1909. 116, no. 9, 1907, p. 19. 159, p. 135. 162, pp. 84-85.

**Index-Independent**

(see Lake Serene)

**Index Peacock (191)**

**Loc:** Sec. 14, (27-10E), on Canyon Cr. above the Gunn Peak prospect, Index dist. **Prop:** 4 claims. **Owner:** A. M. Watt, Seattle, Wash. (1912). **Ore:** Copper. **Ore min:** Chalcopyrite, bornite. **Deposit:** 4-ft. shear zone in granodiorite. **Dev:** 100-ft. adit. **Ref:** 14, p. 18. 162, p. 85.

**Iowa (Mint) (105)**

**Loc:** NW¼ sec. 27, (29-10E), Sultan dist. **Elev:** 2,550 to 2,895 ft. **Access:** Truck road along N. Fk. of Sultan R. crosses the property. **Prop:** Mint and Mint No. 1 claims. **Owner:** Robert T. Curtiss, Monroe, Wash. (1952—). Iowa Mining Co. (1915). Sultan Basin Mining Co., Sultan, Wash. (1940-1945). **Ore:** Copper, gold, silver. **Ore min:** Chalcopyrite and small amounts of scheelite, powellite, molybdenite, sphalerite, bornite, malachite. **Gangue:** Quartz, calcite, chlorite. **Deposit:** Mineralized fracture zones in diorite and metamorphic rocks. Zones vary in width from 2 or 3 in. to 48 in. One lens of ore is 16 to 22 in. thick. **Dev:** 3 adit levels comprise more than 1,000 ft. of underground workings. **Assays:** 104 tons of ore av. 20% Cu, 0.223 oz. Au, 3.23 oz. Ag. 43 tons of ore av. 14.68% Cu, 0.06 oz. Au, 3.10 oz. Ag. **Prod:** 104 tons of ore prior to 1937. 96 tons 1937-1941. **Ref:** 14, p. 47. 23, pp. 63-65. 37, p. 56. 97, 1915, p. 573; 1938, p. 459; 1941, p. 475. 158.

**Iowa (Washington-Iowa)**

(see Washington-Iowa)

**Iron Mountain**

(see under gold)

**Isabell**

(see Red Cross)

**Jackson**

(see St. Louis and Jackson)

**Jamboree (146)**

**Loc:** Sec. 7, (28-11E), Silver Cr. dist. **Ore:** Copper, gold. **Ore min:** Arsenopyrite, chalcopyrite. **Deposit:** 4-ft. vein. **Dev:** 20-ft. adit, 20-ft. shaft. **Ref:** 14, p. 33.

**Jasperson (153)**

(see under gold)

**Jerry Chatman (104)**

**Loc:** N½ sec. 27, (29-10E), Sultan dist. **Elev:** 2,700 ft. **Access:** ½ mi. NW. of the Mint (Iowa) camp by trail. **Prop:** Mint No. 3 claim. **Owner:** Sultan Basin Mining Co. (1943). **Ore:** Copper, tungsten. **Ore min:** Chalcopyrite, bornite, scheelite, malachite. **Gangue:** Quartz, brecciated quartzite, chlorite, serpentine. **Deposit:** 2½- to 4-ft. vein which in 125 ft. thins to 3 in. Vein consists of quartz and narrow zone of brecciated wall rock. **Dev:** 172-ft. adit. **Ref:** 23, pp. 62, 64. 37, p. 56.

**Jesse (4)**

(see under gold)

**Jim Dandy (147)**

(see under gold)

**Johnson (101)**

**Loc:** NE¼ sec. 7 and N½NW¼ sec. 8, (28-8E). **Owner:** Seth G. Johnson (1943). **Ore:** Copper. **Assays:** 8.6% Cu. **Ref:** 158.

**Jones**

(see Kromona)

**Jumbo (119)**

(see under gold)

**Jumbo**

(see under gold)

**Junie**

**Loc:** Sultan dist. **Owner:** Western Metals Corp. (1928). **Ore:** Copper, silver. **Ref:** 106, 9/1/28; 9/17/28, pp. 5-6.

**Justin (17)**

(see under gold)

**Kazian (166)**

**Loc:** S. center sec. 18, (28-11E). **Owner:** John Kazian, 3815 25th So., Seattle, Wash. (1945). **Ore:** Copper, lead, zinc. **Ore min:** Chalcocite, covellite. **Ref:** 158.

**Kelly Creek (103)**

**Loc:** NW¼ sec. 23, (29-10E). **Elev:** 3,200 ft. **Access:** ½ mi. up Kelly Cr. from Sultan Basin road. No trail. **Owner:** Abandoned (1945). **Ore:** Copper. **Ore min:** Pyrite, pyrrhotite, small amount of chalcopyrite. **Deposit:** A 1-ft. zone of sparsely mineralized gouge and breccia. Fractured quartzite with sparsely mineralized quartz veinlets. **Dev:** 30-ft. drift, 15-ft. adit, and 35-ft. adit. **Ref:** 23, p. 71.

**Kena and Trolly**

(see Skrinde)

**Keystone (Hammond) (97)**

**Loc:** Sec. 28, (29-8E), Sultan dist. **Access:** ½ mi. from Sultan Basin road. **Prop:** 4 claims. **Owner:** P. C. Stoess, Seattle, Wash. **Ore:** Copper, gold, silver. **Ore min:** Chalcopyrite. **Deposit:** Shear zones from 25 to 30 ft. wide and carrying disseminated chalcopyrite to a known depth of 300 ft. Exposed length is 700 ft. An est. 3,000 tons of ore in sight. **Dev:** Open cuts, 200-ft. crosscut adit that is expected to reach ore in about 400 more ft., giving a depth of 2,000 ft. **Assays:** Av. 0.27 oz. Au, 1.6 oz. Ag, 1.38% Cu. **Ref:** 14, p. 48. 104, 7/15/34, p. 26. 158.

**Keystone (93)**

(see under gold)

**Keywinder (12)**

**Loc:** SW¼ sec. 27, (32-9E), on Jumbo Mtn., Darrington dist. **Ore:** Copper, gold, silver. **Ore min:** Chalcopyrite. **Deposit:** 3-ft. quartz vein. **Dev:** 75-ft. adit. **Ref:** 14, p. 9. 63, p. 51.

**Kitanning (182)**

**Loc:** Sec. 36, (28-10E) and sec. 31, (28-11E), Index dist., on N. side of the divide between Trout and Lost Creeks. **Elev:** 2,000 ft. **Access:** Adjacent to road on S. side of the N. Fk. of Skykomish R. **Prop:** 5 claims: Cuprite, Wonder, Copper Pick, Copper Idol, Copper Bar. **Owner:** Judson C. Hubbard, Seattle, Wash. (1909). Twentieth Century Alaska Copper Co. (1908). **Ore:** Copper. **Ore min:** Chalcopyrite, bornite, chalcocite, pyrite. **Gangue:** Quartz, crushed granodiorite. **Deposit:** Small body of high-grade ore in the form of a 2½-ft. mineralized shear zone

in granodiorite. **Dev:** 525-ft. adit. **Ref:** 14, p. 18. 33, 1908, p. 1345. 88, p. 82. 114, no. 4, 1907, p. 55. 162, pp. 76-77.

### Kromona (Scriber, Jones) (109)

**Loc:** Near center sec. 13, (28-9E), in Sultan Basin. **Elev:** 2,500 to 5,000 ft. **Access:** 5 mi. from Olney Pass by road. About 19 mi. from railroad at Sultan. **Prop:** 8 claims, 5 millsites. **Owner:** Kromona Mines Corp., Seattle, Wash. (1937—). Kromona Mining & Smelting Co. (1916-1937). **Ore:** Copper, silver, gold, molybdenum, tungsten. **Ore min:** Chalcopryrite, pyrite, pyrrhotite, molybdenite, scheelite, powellite, marcasite, bornite, malachite. **Gangue:** Quartz, calcite, shattered wall rock. **Deposit:** Shear zone across the contact of quartz diorite and old metamorphic rocks. Ore in places is slightly radioactive. **Dev:** 800-ft. adit with 225-ft. drift at 3,500 ft. elev. and a 58-ft. drift at 3,800 ft. (1953). Natural cave called the "Bear Cave." Development work in 1954 totaled 1,500 lineal ft. of raises, drifts, and crosscuts. **Improv:** Tram, 120-ton mill, bunkhouse (1955). **Assays:** 7 old assays show 1.4% to 38.4% Cu, 1.2 to 18.2 oz. Ag, 0.05 to 2.0 oz. Au. Later information indicates av. to be 2% to 4% Cu, 1 to 2 oz. Ag, \$2 to \$4 Au. A 4,860-lb. test shipment in 1952 showed 0.58 oz. Au, 1.76 oz. Ag, 12.81% Cu. One assay across a 6-ft. vein showed 7.62% Cu, 2.18 oz. Ag, 0.24 oz. Au. **Prod:** 4,860-lb. test shipment in 1952 gave net smelter return of \$138.06. 1953. 102 tons conc. in 1954 had av. assay of 24.33% Cu, 4.20 oz. Ag, 0.5 oz. Au, and netted \$13,191. 1955. **Ref:** 14, p. 48. 23, pp. 75-78. 37, p. 56. 98, 1918-1926. 104, 4/30/34, pp. 21-22. 106, no. 2, 1920, pp. 4-5; 9/1/28. 112, p. 187. 117, no. 14, 1922, p. 5. 129, pp. 293-296. 133, p. 36. 158.

### Lake Serene (Index-Independent, Wilbur Index, Index, Pride of Index) (198)

**Loc:** SW $\frac{1}{4}$  sec. 30, (27-10E), about 2 mi. S. of Index. **Access:** 3 mi. by road from railroad at Index. **Prop:** 5 claims: Sixteen to One, Crown Jewel, Copper Queen, Mystery, Pride of Index. **Owner:** Lake Serene Mining Co., Inc., Snoqualmie, Wash. (1949-1951). Index-Independent Mining Co. (1902-1907). **Ore:** Copper, gold, silver. **Ore min:** Bornite, chalcopryrite, chalcocite, pyrite, azurite. **Gangue:** Quartz. **Deposit:** Mineralized fissures in granodiorite. Current exploration has exposed an 8-in. vein of solid bornite (1950). **Dev:** Three adits, one 470 ft., one 170 ft., and another 261 ft. long. **Improv:** Cabin, 80-ton bunker (1951). **Assays:** High-grade ore \$98.98 per ton. **Prod:** 4 carloads prior to 1901. Shipped to Tacoma smelter in 1949. **Ref:** 14, p. 15. 33, 1907, p. 689. 88, pp. 80-81. 97, 1916, p. 614. 150, p. 34. 162, pp. 87-88.

### Lakeview Extension (36)

(see under gold)

### Lambert

**Loc:** Sultan Basin dist. **Owner:** Western Metals Corp. (1928). **Ore:** Copper, silver. **Ref:** 106, 9/1/28.

### Last Dollar (148)

**Loc:** Sec. 8, (28-11E), adjacent to the Bluff prospect, Silver Cr. dist. **Ore:** Copper, gold. **Ore min:** Chalcopryrite, pyrite. **Deposit:** Vein with 10 in. of ore. **Assays:** 7% Cu, \$18 Au. **Ref:** 14, p. 34. 63, p. 31.

### Lida (118)

**Loc:** Sec. 29, (29-11E), adjoining the Edison property on the NE., Silver Cr. dist. **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, arsenopyrite, pyrite. **Dev:** 15-ft. shaft. **Ref:** 14, p. 34. 63, p. 29.

### Little Chief (76)

**Loc:** N $\frac{1}{2}$  sec. 5, (29-10E). **Elev:** 3,000 to 3,700 ft. **Access:** Near Williamson Cr. trail, 4 $\frac{1}{2}$  mi. from Sultan Basin road.

**Prop:** 7 patented claims and 2 millsites. **Owner:** Sykes estate, Continental Illinois National Bank & Trust Co., trustee (1943). Stilaguamish & Sultan Mining Co. (1902-1918). **Ore:** Copper, gold, silver, cobalt, nickel. **Ore min:** Chalcopryrite, pyrrhotite, arsenopyrite, copper carbonate. **Gangue:** Quartz, calcite, amphibole. **Deposit:** Quartz 2 to 5 in. wide along fracture zones in quartzite and conglomerate. **Dev:** Two adits, one 410 ft. long, the other 145 ft. long. **Assays:** Tr. Ni in some specimens. **Ref:** 13, p. 167. 14, pp. 48-49. 23, pp. 49-50. 33, 1907, p. 1051. 63, p. 23. 88, p. 68. 98, 1918, p. 136. 158.

### Lost Creek (179)

**Loc:** Secs. 29, 31, and 32, (28-11E), along Lost Cr., Index dist. **Elev:** 3,800 ft. **Access:** Trail up Lost Cr. **Prop:** 15 claims. **Owner:** E. J. Wallace and C. L. Byron, Seattle, Wash. (1912). Lost Creek Mining Co. (1897). **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, bornite, chalcocite, pyrite. **Gangue:** Quartz, quartzite. **Deposit:** 8-ft. fracture zone in quartzite contains disseminated ore minerals. **Dev:** 3 adits and a 57-ft. shaft. **Assays:** \$4 Au, 2.8 oz. Ag. **Ref:** 14, p. 18. 63, p. 84. 162, pp. 80-81.

### Louise

(see Mineral Center under gold)

### Lucky Strike (50)

**Loc:** Sec. 24, (30-9E). **Access:** 32 mi. from railroad at Hartford. **Owner:** Erick Schedin, Silverton, Wash. **Ore:** Copper. **Dev:** Adit. **Ref:** 158.

### Lucky Strike (60)

**Loc:** Sec. 3, (30-9E), on W. side of valley, close to Marten Cr., on Long Mtn. **Elev:** 3,700 to 3,800 ft. **Owner:** Hugh Fox and Ed Owens (1926). **Ore:** Copper, bismuth. **Ore min:** Chalcopryrite, bismuthinite, pyrite, pyrrhotite. **Deposit:** Sulfides in metasediments near contact with granodiorite. **Ref:** 14, p. 44. 158.

### M and H No. 2 (149)

(see under gold)

### McCombs

(see Jasperson under gold)

### Mackinaw (Weden Creek) (89)

**Loc:** SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 19, (29-11E), on W. Fk. Weden Cr., about 3 mi. from Monte Cristo. **Elev:** 3,000 to 3,600 ft. **Access:** 2 mi. road up Weden Cr.; 41 mi. to railroad at Hartford. **Prop:** 18 claims and 3 millsites. **Owner:** Mackinaw Metals Co., Donald Baker, Seattle, Wash. (1944, 1954—). E. C. Baker, Garrett Cleary, M. T. S. Comins (1900). Mackinaw Mining & Milling Co. (1910). Mackinaw Minerals Co. (1934). Utility Mining Co., R. D. Taft, Everett, Wash., lessee (1941-1947). **Ore:** Copper, nickel, cobalt, gold, silver, uranium (?). **Ore min:** Pyrite, chalcopryrite, malachite, chrysocolla, garnierite, erythrite, pyrrhotite, chloanthite, cubanite, pentlandite. **Gangue:** Quartz, carbonates, serpentine. **Deposit:** Mineralized fracture zone that can be traced for 3,000 ft. on the surface and that has a known depth of 125 ft. Ore body is from 11 to 30 ft. wide with a known length of 90 ft. Fracture zone occurs along a fault separating serpentine from arkose. Ore minerals occur as disseminated grains and blebs in serpentine and may total as much as 20% of the rock in spots. The ore shoots are in small lenses. Ore reserves are not large. **Dev:** 4 adits, 255, 146, 686, and 24 ft. long. Also a caved adit and an open cut. **Assays:** 4-ft. sample from a raise in No. 2 adit showed 0.02 oz. Au, 0.25% Ni. Weighted av. of about 30 reliable assays of ore zone av. 13.8 ft. wide, 112 ft. long exposed in No. 3 adit is 2.30% Cu, 0.86% Ni, 0.13 oz. Au. Ore zone around No. 4 and No. 5 adits had a weighted av. of 3 samples of 1.12% Cu, 1.06% Ni, 0.16 oz. Au. The highest cut, 1,000 ft. beyond No. 5 adit, showed 0.20% Cu, 0.99% Ni from a grab sample. A 500-lb.

metallurgical sample supplied by the owner and tested by the U. S. Bureau of Mines showed 2.7% Cu, 1.0% Ni, 0.05% Co, 8.9% Fe, 0.9% As, 3.9% S, 30.6% SiO<sub>2</sub>, 0.2% CaO, 0.11 oz. Au, 0.30 oz. Ag. Slight radioactivity in some samples. **Prod:** A few tons shipped 1900-1910. **Ref:** 14, p. 24. 51, p. 11. 157. 158.

### Magus

(see "45" under silver)

### Mamie (75)

**Loc:** Sec. 29, (30-10E), about 2 mi. S. of Silverton. **Ore:** Copper. **Prod:** Small amount in 1916. **Ref:** 14, p. 40. 97, 1916, p. 614.

### Manley (13)

**Loc:** SW¼ sec. 27, (32-9E), on Jumbo Mtn., Darrington dist. **Ore:** Copper, gold. **Ore min:** Chalcopryrite. **Deposit:** 3 ft. of chalcopryrite ore. **Dev:** 130-ft. adit. **Assays:** \$8 Au. **Ref:** 14, p. 10. 63, p. 51.

### Marguerite Mosher

**Loc:** Sultan dist. **Owner:** Western Metals Corp. (1928). **Ore:** Copper, silver. **Ref:** 106, 9/1/28; 9/17/28, pp. 5-6.

### Martin Engdahl (150)

(see under lead)

### Marvel (115)

**Loc:** SW¼ sec. 2, (28-10E). **Elev:** 3,800 ft. **Access:** Reached by hiking up Elk Cr. from Sultan Basin road. **Prop:** 2 unpatented claims: Marvel, June. **Owner:** C. F. Smith and Vance Curtiss (1937). **Ore:** Copper. **Ore min:** Chalcopryrite, small amounts of pyrrhotite, scheelite, sphalerite. **Gangue:** Quartz. **Deposit:** 2 veins of nearly massive chalcopryrite, one 2 in., the other 1 in. wide separated by 2 in. of altered quartz diorite. **Dev:** 15 ft. of open cut work. **Ref:** 23, p. 74.

### Merchant (Copper, Empire) (192)

**Loc:** Center S½ sec. 18, (27-11E), on W. side of Trout Cr. about 4 mi. from its mouth, Index dist. **Elev:** 3,500 ft. **Access:** Trail and road up Trout Cr. **Prop:** 12 unpatented claims including: Fred P., Big Goat, Ore or No Go. **Owner:** J. N. Erlandsen, Everett, Wash. (1950). Skykomish Copper Co. (1929-1930). Ivan Merchant, Salem, Oreg. (1942). **Ore:** Copper. **Ore min:** Chalcopryrite, bornite, pyrite, magnetite, hematite. **Gangue:** Quartz, crushed country rock. **Deposit:** 4 shear zones in granodiorite, slate, and quartzite. Shear zones range from a few in. to 12 ft. in width. 80,000 tons of ore in sight. **Dev:** Main adit 1,700 ft. long with drifts. 3 other adits, 150 ft., 500 ft., and 175 ft. long. **Improv:** 2 cabins. **Ref:** 14, p. 18. 63, pp. 34-35. 106, 12/19/29; 5/1/30, p. 20; 7/21/30. 157. 158. 162, pp. 77-78.

### Miiki Maru (116)

(see under gold)

### Milwaukee (53)

(see under zinc)

### Mineral Center (131)

(see under gold)

### Mineral Mines (154)

**Loc:** SE¼ sec. 6, (28-11E). **Access:** 3½ mi. by truck road up Silver Cr. from Galena. **Owner:** Mineral Mines, Inc., Seattle, Wash. (1941). **Ore:** Copper, gold, silver, lead, zinc. **Ore min:** Chalcopryrite, pyrite, galena, sphalerite. **Deposit:** Large mineralized shear zone in limestone. **Dev:** 375-ft. crosscut adit. **Ref:** 14, p. 35. 46, p. 171.

### Mint

(see Iowa)

### Molly (176)

(see under uranium)

### Molly

(see under gold)

### Monitor and Sterling (70)

**Loc:** Sec. 14, (30-9E), on Marten Cr., Silverton dist. **Prop:** 2 claims. **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, tetrahedrite. **Deposit:** 30 in. of ore. **Dev:** 20-ft. adit. **Ref:** 14, p. 45. 63, p. 22.

### Monte Cristo (95)

(see under gold)

### Montezuma (61)

**Loc:** Sec. 3, (30-9E), Silverton dist. **Prop:** 1 patented claim. **Ore:** Copper. **Ref:** 14, p. 45.

### Morning Star (136)

(see under lead)

### Mosher

(see Marguerite Mosher)

### Mountain Cedar (Paystreak, Mystery) (100)

**Loc:** Near center sec. 17, (29-10E). **Elev:** 2,000 to 3,500 ft. **Access:** ¼ mi. of trail from Sultan Basin road. **Prop:** 4 unpatented claims. **Owner:** C. F. Smith (1943). **Ore:** Copper, gold, silver, nickel (?). **Ore min:** Pyrite, pyrrhotite, arsenopyrite, chalcopryrite, a little sphalerite, bornite, free sulfur, small grains of chromite. **Gangue:** Quartz, serpentine. **Deposit:** 2- to 10-ft. vein along a shear zone in metamorphic rocks and serpentine. **Dev:** 5 open cuts; 40-ft., 18-ft., 46-ft., 63-ft., and 31-ft. adits. **Assays:** One specimen of ore assayed 5.06% Cu, 0.06 oz. Au, 9.05 oz. Ag, tr. Ni. **Ref:** 14, p. 49. 23, pp. 71-73. 58, p. 47. 129, p. 298.

### Myrtle C. (18)

**Loc:** NE¼ sec. 19, (32-10E), on Gold Mtn., Darrington dist. **Prop:** 9 claims. **Owner:** Burns Mining Co. (1907-1918). **Ore:** Copper, gold, silver, mercury. **Ore min:** Chalcopryrite, tetrahedrite, pyrite, cinnabar, native gold, native mercury. **Deposit:** 7 veins ranging from 9 in. to 6 ft. in width. **Assays:** \$8 to \$26 Au, tr. to 41 oz. Ag, 18% to 36% Cu. **Ref:** 14, p. 10. 33, 1907, p. 400. 63, p. 52. 98, 1918, p. 62.

### Mystery (Monte Cristo, Pride)

(see Monte Cristo under gold)

### Mystery (Mountain Cedar, Paystreak)

(see Mountain Cedar)

### National (126)

**Loc:** Sec. 31, (29-11E), on E. side of the W. Fk. of Silver Cr. **Elev:** 4,000 ft. **Owner:** E. H. Hubbard, T. D. Brown, and Thomas Lockwood (1892). **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, pyrite, marcasite, arsenopyrite. **Deposit:** 75-ft. porphyry dike slightly mineralized and cut by a more heavily mineralized shear zone. **Dev:** 185-ft. adit, 75-ft. adit, 20-ft. shaft. **Assays:** \$35 to \$300 per ton. **Ref:** 12, pp. 87-88. 13, p. 160. 14, pp. 35-36. 63, p. 30.

### Nemo (35)

(see under gold)

### Nesta (7)

**Loc:** Sec. 34, (32-9E), about 3 mi. S. of Darrington, on Jumbo Mtn. **Elev:** 800 to 3,900 ft. **Access:** Within 1 mi. of good county road. **Prop:** 25 claims. **Owner:** Ole and Pete Nesta, Darrington, Wash. (1950). **Ore:** Copper, gold, silver, molybdenum, lead, zinc. **Ore min:** Pyrite, sphalerite, galena. **Deposit:** 10 veins from 2 to 10 ft. wide. Quartz veins 1 to 2 ft. thick in altered diorite. Molybdenum showings are small and scattered and only on the S. part of the claims. **Dev:** 12 adits aggregating 1,150 ft. **Improv:** Good cabin (1950). **Assays:** From \$5 to \$100

for hand samples. Av. values are very low. **Ref:** 14, p. 10. 111, p. 6. 158.

### Nevada (85)

**Loc:** Sec. 12, (29-11E), ¼ mi. SE. of Goat Lk., Monte Cristo dist. **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, pyrite. **Deposit:** 3- to 10-ft. mineralized fracture zone that carries 3 ft. of good ore and some concentrating ore. **Dev:** 60-ft. adit. **Ref:** 14, p. 24. 63, p. 15.

### New Seattle (28)

(see under silver)

### New York (51)

**Loc:** SW¼ sec. 20, (30-10E), Silverton dist. **Ore:** Copper, gold, silver. **Ore min:** Arsenopyrite, chalcopryrite. **Deposit:** 4-ft. vein. **Dev:** 20-ft. adit. **Assays:** \$15 to \$17 Au, Ag, Cu. **Ref:** 14, p. 45. 63, p. 19.

### New York-Seattle (137)

**Loc:** Sec. 4, (28-11E), Silver Cr. dist. **Access:** 13 mi. by poor road to railroad. **Prop:** 8 claims. **Owner:** New York-Seattle Copper Mining Co. (1907-1926). **Ore:** Copper, gold, silver. **Deposit:** 4 veins 4 to 20 in. wide. **Dev:** 212 ft. in shafts, 1,250 ft. of adits. **Assays:** Av. \$14.42 Cu. **Prod:** Shipments of ore were made to the smelter in Everett in 1908. **Ref:** 14, p. 28. 33, 1907, p. 863; 1908, pp. 1039-1040. 97, 1907, p. 475. 98, 1920-1926. 114, no. 4, 1907, p. 55; no. 5, 1909, p. 105. 116, no. 10, 1907, p. 19.

### Nickel Bird (52)

**Loc:** Sec. 21, (30-10E). **Elev:** 3,500 ft. **Access:** 2 mi. by trail from a place on the highway ½ mi. W. of the Big Four Inn. **Prop:** 1 claim (may be the old Hoodoo). **Owner:** Erick Shedin and V. D. McCrory (1942). **Ore:** Copper, lead, silver. **Ore min:** Chalcopryrite, pyrrhotite, argentiferous galena. **Gangue:** Quartz, calcite. **Deposit:** Mineralized fracture zones in conglomerate and argillite. Most of the zones are very narrow, but one is 4 ft. wide. This one pinches out in a distance of 8 ft., however. **Dev:** Drifts and crosscuts on one level total about 1,000 ft. **Ref:** 158.

### Non Pareil (186)

**Loc:** SW¼ sec. 6, (27-11E), on NE. side of Trout Cr., 1 mi. SE. of the Sunset mine, Index dist. **Elev:** 2,500 ft. **Access:** Truck road, 7½ mi. to railroad at Index. **Prop:** 32 claims including: Imperial, Blue Mud, New Lone Star. **Owner:** Non Pareil Consolidated Copper Co. (1903-1912). **Ore:** Copper, gold, silver, cobalt, nickel. **Ore min:** Chalcopryrite, bornite, pyrite, chalcocite, malachite. **Gangue:** Quartz, altered granodiorite. **Deposit:** 4 sparsely mineralized shear zones in granodiorite from 1 to 20 ft. wide. **Dev:** Several open cuts and 1,700 ft. of adit with drifts. **Assays:** Assays are reported to have shown 1.14% Co. **Ref:** 14, p. 18. 111, p. 5. 114, no. 4, 1907, p. 55. 116, no. 5, 1908, pp. 117, 130. 162, pp. 73-74.

### North Star (Oldfield, Sunrise)

(see Sunrise under gold)

### North Star (196)

**Loc:** Sec. 4, (27-10E), at the headwaters of North Star Cr., Index dist. **Elev:** 2,570 ft. **Access:** Trail up North Star Cr. **Prop:** 14 claims. **Owner:** North Star Mining Co. (1902-1912). **Ore:** Copper. **Ore Min:** Chalcopryrite bornite, pyrite. **Gangue:** Quartz, crushed and altered granodiorite. **Deposit:** Irregular bands of ore minerals 2 to 3 in. wide occur in a shear zone in granodiorite. **Dev:** 2 adits totaling 1,100 ft. **Ref:** 14, pp. 18-19. 33, 1907, p. 875. 88, p. 82. 162, pp. 86-87.

### Northwest Consolidated

(see under gold)

### O and B (92)

**Loc:** Sec. 21 or NW¼ sec. 28, (29-11E), about ½ mi. SW. of Monte Cristo on slope of Silvertip Peak. **Elev:** 4,700 ft. **Access:** Trail from Monte Cristo. **Prop:** 13 unpatented claims: Legal Tender Nos. 1 to 13. **Owner:** A. H. Reiser, 1231 N. 50th St., Seattle, Wash. (1942). Boston American Mining Co. (1902-1934). **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, arsenopyrite, pyrite, galena, sphalerite, realgar. **Gangue:** Quartz, calcite. **Deposit:** Ore bodies as much as 4 ft. wide occur in a 2- to 50-ft. fracture zone in andesite. **Dev:** 3 adits connected by raises and a 3,400-ft. crosscut that fails to penetrate ore. **Assays:** \$35 per ton. **Prod:** About 12 carloads of hand-sorted ore were shipped to the Everett smelter prior to 1901. **Ref:** 14, p. 21. 63, pp. 13-14. 88, pp. 72-73. 98, 1918-1926. 112, p. 170. 118. 149, pp. 813, 814. 158.

### Occidental (80)

(see under gold)

### Oldfield

(see Sunrise under gold)

### Olson (54)

**Loc:** Near S. center sec. 33, (30-10E), on steep SE. slope of Big Four Mtn. **Elev:** 5,000 ft. **Ore:** Copper. **Ore min:** Iron oxides and sulfides, and copper sulfides. **Deposit:** 1-in. to 4-ft. mineralized zone exposed for 200 ft. in slate. Mineralization is mostly very sparse. **Dev:** Adit 40 to 50 ft. long. **Ref:** 158.

### Ore Recoveries (40)

(see also Cleveland, Hoodoo, Virginia under copper, and Copper Independent, Eclipse under gold)

**Loc:** SE¼ sec. 19, (30-10E), at Silverton. **Access:** Road. **Prop:** 14 claims, including Eclipse, Independent, Virginia, Cleveland, Hoodoo. **Owner:** Ore Recoveries Corp. (1942). **Ore:** Copper, gold, silver, arsenic, tin. **Deposit:** Quartz veins. **Dev:** Several thousand ft. of adits, raises, and shafts. **Assays:** Av. \$3 to \$7, with 75% of the value in Au. **Prod:** 200 tons concentrated and shipped to smelter in 1940. **Ref:** 158.

### Oro Fino (167)

**Loc:** SE¼ sec. 20, (28-11E), Silver Cr. dist. **Prop:** 5 claims. **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, native copper. **Deposit:** 7-ft. mineralized shear zone that carries 4 ft. of ore. **Dev:** 80-ft. adit. **Assays:** As high as \$56 per ton. **Ref:** 13, p. 159. 14, p. 36. 63, p. 32.

### P. I. (168)

**Loc:** Sec. 17, (28-11E), about 1 mi. NE. of Galena, Silver Cr. dist. **Ore:** Copper, silver, lead. **Ore min:** Chalcopryrite, galena. **Deposit:** 4-ft. shear zone with 2 ft. of ore. **Dev:** Open cuts. **Assays:** \$26 Ag, \$32 Cu. **Ref:** 14, p. 36. 63, p. 32.

### P. and I. (91)

(see under gold)

### Palmer

(see under nickel)

### Paystreak

(see Mountain Cedar)

### Penn

(see Foggy)

### Philo (94)

**Loc:** Sec. 23, (29-11E), on W. side of Cadet Peak, Monte Cristo dist. **Prop:** 3 claims. **Ore:** Gold, silver, copper. **Ore min:** Arsenopyrite, chalcopryrite, pyrite. **Deposit:** Mineralized fracture zone carrying 15 in. of high-grade ore and 2 ft. of concentrating ore. **Dev:** 20-ft. and 40-ft. adits. **Ref:** 14, p. 24. 63, p. 14.



**Pride**

(see Monte Cristo under gold)

**Pride of Index**

(see Lake Serene)

**Queen Anne (14)**

(see under gold)

**Red Cross (Isabell) (159)**

**Loc:** SE¼ sec. 36, (28-9E), 2 mi. N. of Reiter, Index dist.  
**Access:** 1 mi. by trail up May Cr. **Prop:** 10 claims. **Owner:** Red Cross Mining Co. (1907-1912). **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, bornite, pyrite. **Gangue:** Quartz. **Deposit:** Veins in granodiorite. **Dev:** Several short adits and open cuts. **Assays:** One sample ran 4% Cu, 0.05 oz. Au, 1 oz. Ag. **Ref:** 14, p. 19. 116, no. 10, 1907, p. 18. 158. 162, p. 92.

**Ruby King (151)**

(see under gold)

**Rudebeck-Florence Rae**

(see Florence Rae)

**Rustler (83)**

**Loc:** Sec. 11, (29-10E), in a deep canyon, Monte Cristo dist.  
**Ore:** Copper, molybdenum, lead, zinc. **Ore min:** Pyrrhotite, pyrite, chalcopryrite, molybdenite, galena, sphalerite. **Deposit:** Narrow pinching veins of quartz containing the sulfide minerals. A little molybdenite shows along seams of quartz in one adit. **Dev:** Several short adits and a shallow shaft. **Assays:** Est. 1% to 2% Cu over a width of 1 or 2 ft. In the shaft a 2-ft. width might av. 10% combined Zn, Pb, Cu. **Ref:** 158.

**S. M. P. (155)**

(see under zinc)

**Sadie**

(see Helena and Sadie)

**St. Cloud (62)**

**Loc:** Sec. 4, (30-9E), Silverton dist. **Ore:** Copper. **Ref:** 14, p. 45.

**St. Louis (156)**

**Loc:** Sec. 6, (28-11E), on Cascade Gulch, Silver Cr. dist.  
**Prop:** 4 claims. **Ore:** Copper, gold, silver. **Ore min:** Pyrite, chalcopryrite. **Deposit:** 5- to 15-ft. mineralized shear zone in granite carries 2 to 12 in. of ore. **Dev:** Numerous open cuts. **Assays:** \$5 Cu, \$4 Au, \$3 Ag. **Ref:** 14, p. 36. 63, pp. 29-30.

**St. Louis and Jackson (27)**

**Loc:** Near center sec. 1, (30-9E), or SW¼ sec. 8, (30-10E) (?), on Deer Cr. about 3 mi. N. of Silverton. **Access:** 3 mi. up Deer Cr. from Silverton, 1¼ mi. from end of road. **Prop:** 4 claims: Calseela, Waine, Kent, Manhattan. **Owner:** Theresa McCormick, Seattle, and W. C. Turk, Grants Pass, Oreg. (1953 —). **Conservative Mining Co.** (1907-1909). **Ore:** Copper, gold, silver, tungsten. **Ore min:** Chalcopryrite, pyrite, scheelite, tetrahedrite (?). **Gangue:** Sheared granite, quartz. **Deposit:** Well-mineralized quartz vein 1 to 6 in. wide along a shear zone in granite. **Dev:** Adit consisting of 600 ft. of drift and 200 ft. of crosscut, and a 150-ft. adit on the vein 100 ft. higher. **Assays:** 30% Cu, \$20 Au, \$23 Ag. As much as 1½% WO<sub>3</sub>. **Prod:** Small amount prior to 1901 and in 1909. **Ref:** 14, p. 40. 33, 1907, p. 992. 63, p. 20. 88, p. 69. 98, 1918, p. 72.

**St. Theresa (108)**

(see under molybdenum)

**Sam Strom (21)**

**Loc:** Sec. 24, (32-9E), 1 mi. SE. of Darrington. **Access:** 1 mi. by good road to railroad at Darrington. **Prop:** 7 patented

claims: Burns, Burns Nos. 2 and 3, Howard Rose, Howard Rose No. 2, Frank, Moline, Moline No. 2. **Owner:** Sam Strom, Darrington, Wash. (1942). **Ore:** Copper, gold, silver. **Ore min:** Pyrite, Chalcopryrite, arsenopyrite. **Gangue:** Quartz and sheared slate and diorite. **Deposit:** Mineralized shear zone in diorite and slate. Zone 500 ft. wide composed of altered country rock and quartz veinlets. Many thousands of tons of ore in sight. **Dev:** 1,000-ft., 600-ft., 500-ft., 250-ft., 175-ft. adits and several open cuts. **Assays:** High-grade ores \$10 to \$30 Au, 3 oz. Ag, 10% Cu. Low-grade ores carry \$5 to \$7 values. **Prod:** Some sorted ore produced. **Ref:** 14, p. 7. 158.

**Scriber**

(see Kromona)

**Seattle**

(see New York-Seattle)

**Seattle**

(see under gold)

**Shirley (169)**

(see under gold)

**Sidney (96)**

(see under gold)

**Silver Coin (66)**

(see under gold)

**Silver Creek**

(see Broken Ridge)

**Silver Horseshoe (55)**

(see under silver)

**Silver Slipper (157)**

(see under gold)

**Skrinde (Kena and Trolly) (170)**

**Loc:** NE¼ sec. 18, (28-11E), near the Silver Queen property.  
**Access:** Road up Silver Cr. **Prop:** 5 unpatented claims: Trolly, Trolly Nos. 1 and 2, Betty, Shirley. **Owner:** W. E. Skrinde, Index, Wash. (1939). **Ore:** Copper, gold, silver. **Ore min:** Pyrite, chalcopryrite. **Deposit:** Narrow mineralized shear zone in limestone stained brown by limonite. **Dev:** 170-ft. adit. **Ref:** 14, p. 37. 158.

**Sloman**

(see under gold)

**Smith-Way (171)**

**Loc:** Secs. 17 and 20, (28-11E), 1 mi. up Silver Cr. from its mouth. **Elev:** 1,500 ft. **Access:** 10 mi by road from railroad at Index. **Prop:** 8 unpatented claims: Morning Glory, Vivian, Ione, Ruth, Gladys, Pearl, Maggie, Florence. **Owner:** Frank Smith, Index, Wash. (about 1944). **Ore:** Copper. **Ore min:** chalcopryrite, pyrite, bornite. **Gangue:** Quartz. **Deposit:** Mineralized zone about 10 ft. wide contains many small stringers of sulfides about 250 ft. above the river. 600 ft. above and 1,500 ft. E. of river is a 7-ft. quartz vein strongly mineralized with copper sulfides. **Dev:** Short adit. **Ref:** 157.

**Sterling**

(see Monitor and Sterling)

**Sultan King (Sultan Queen, Hicks) (117)**

**Loc:** S½ sec. 36, (29-10E) and N½ sec. 1, (28-10E). **Elev:** 3,300 to 5,000 ft. **Access:** 3 mi. trail from end of Sultan Basin road, or old trail from Silver Cr. road 1 mi. to E. **Prop:** 8 patented claims, 8 unpatented claims. **Owner:** Sultan King Mining Co., Seattle, Wash. (1936-1943). **Ore:** Copper, gold, silver, molybdenum. **Ore min:** Chalcopryrite, pyrite, pyrrhotite, marcasite, magnetite, specular hematite, small amounts molyb-



denite and arsenopyrite. **Deposit:** Several quartz veins along fault zones near contact of quartz diorite and metamorphics. One vein 12 to 72 in. wide at least 1,000 ft. long. **Dev:** 1,200 ft. of underground workings in one entry. Several shorter adits and open cuts. **Assays:** 56 assays across the main vein along 500 ft. of its length showed weighted av. of 0.93% to 2.73% Cu, av. 48 in. wide. **Prod:** 24 tons of ore reportedly valued at \$42 per ton shipped to Tacoma smelter in 1920. **Ref:** 14, p. 49. 23, pp. 51-55. 63, p. 25. 97, 1920, p. 268. 104, 7/15/36, p. 30. 129, pp. 298-299. 158.

### Sultan Queen

(see Sultan King)

### Sunrise (102)

**Loc:** N. line sec. 15, (29-10E), near summit of Sunrise Mtn. **Elev:** 4,400 to 4,600 ft. **Access:** 2 mi. up Vesper Cr. by trail from Sultan Basin road, by which it is 26 mi. to railroad at Sultan. **Prop:** 4 unpatented claims: Wall Street, Occidental, Quaker City, Eldorado. **Owner:** George Startup, Startup, Wash., and Bob Curtiss, Monroe, Wash. (1947). C. H. Kelly, Monroe, Wash. (1913-1943). **Ore:** Copper, gold, silver, molybdenum. **Ore min:** Chalcopryrite, molybdenite, pyrrhotite, bornite. **Gangue:** Quartz, siderite, brecciated metamorphics. **Deposit:** Quartzite and hornfels in which there are mineralized breccia and quartz veinlets extending outward from a pipe-like breccia mass 500 ft. or more in dia. and exposed to a depth of 350 ft. **Dev:** 45-ft. adit, 255-ft. adit, 35-ft. adit, 850-ft. adit, 3 open cuts. **Assays:** 2% to 4% Cu, 0.02 to 0.05 oz. Au, 0.4 to 4.8 oz. Ag from selected samples. Av. of deposit as a whole would be less than 1% Cu, 0.02% Mo. **Ref:** 14, p. 50. 23, pp. 68-70. 111, p. 9. 158.

### Sunrise (9)

(see under gold)

### Sunset (183)

**Loc:** Sec. 1, (27-10E) and sec. 6, (27-11E), on N. side of Trout Cr. about 6 mi. NE. of Index. **Elev:** 1,399 ft. **Access:** 7 mi. by road from railroad at Index. **Prop:** 19 patented claims, 8 unpatented claims, and deeded land, totaling 960 acres. **Owner:** Index Mining Co., Seattle, Wash. (1946—) leasing to Granore Co. (1955—). Ezra and Arthur Egbert (1897). Sunset Copper Co. (1902-1935). Sunset Syndicate Corp. (1936-1937). Kromona Mines Corp. (1941-1943). **Ore:** Copper, gold, silver. **Ore min:** Bornite, chalcopryrite, covellite, pyrite, chalcocite, native copper, native silver. **Gangue:** Quartz, calcite. **Deposit:** 5 main shear zones in granodiorite, with lenses of ore a few in. to 16 ft. wide. Footwall usually well developed, hanging wall ill defined. **Dev:** 5 levels with about 12,000 ft. of workings, a 365-ft. winze. Lower 3 levels were flooded in 1942. 3,746 ft. of diamond drilling by U. S. Bureau of Mines in 1950. **Assays:** Av. of all production is 2.45% Cu, 0.59 oz. Ag, 0.0057 oz. Au. **Prod:** 1902-1905, 1907, 1916-1930. From November 1926 to July 1929 there were 193,112 tons of ore produced. Since that time only small shipments of high-grade ore have been made. Produced 1931, 514 tons; 1936-1940, \$74,418; 1946, one carload from dump; 1949, 84 tons ore. Total production is 1,500 oz. Au, 156,000 oz. Ag, 12,912,000 lb. Cu from 263,500 tons of ore. **Ref:** 7-A, p. 12. 14, p. 16. 33, 1907, p. 1058. 43, 1927, p. 212. 88, pp. 79-80. 91, p. 248. 97, 1907, 1916-1931, 1937-1945, 1947, 1950. 98, 1918-1926. 99, 1/29/35. 104, 7/15/34, p. 26; 4/15/36, p. 27; 6/30/36, p. 25; 10/30/36, p. 33. 106, no. 14, 1920, p. 5; 2/4/32, p. 4. 112, p. 205. 113, 6/34, p. 5. 114, no. 4, 1907, p. 55; no. 5, 1909. 129, pp. 282-290. 130, p. 63. 141, pp. 20, 22. 150, p. 33. 152-B. 158. 159, p. 135. 162, pp. 71-73.

### Threadwell

(see under gold)

### Treasure Box

(see Horseshoe and Treasure Box under gold)

### Troly

(see Skrinde)

### Uncle Sam (193)

**Loc:** Sec. 23, (27-10E), on S. slope of the divide between Lewis and Barclay Creeks, Index dist. **Elev:** 3,200 ft. **Access:** 4-mi. trail from Index or a 3-mi. trail from Baring. **Prop:** 4 claims: Zenith, Baring Star, Barclay Bluffs, Minoka. **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, bornite, pyrite, hematite. **Gangue:** Quartzite, garnet, hornblende. **Deposit:** Mineralized shear zone from 10 to 12 ft. wide in quartzite. **Dev:** 3 adits totaling 400 ft. **Assays:** Picked samples ran from 3% to 4.5% copper, with small amounts of gold and silver. **Ref:** 13, p. 149. 14, p. 19. 162, pp. 81-82.

### Vesper Peak

(see "48-55")

### Victory

(see under gold)

### Virginia (39)

(see also Ore Recoveries)

**Loc:** SW¼ sec. 19, (30-10E), at Silverton. **Access:** Road. **Prop:** One of a group of 14 claims. **Owner:** Ore Recoveries Corp. (1942). Virginia-Agenda Co. (1922-1930). **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, arsenopyrite. **Dev:** Several thousand ft. of adits, raises, and shafts. **Ref:** 14, p. 45. 97, 1930, p. 675. 98, 1922-1926.

### Washington-Iowa (132)

(see also Mineral Center under gold)

**Loc:** Sec. 32, (29-11E), Silver Cr. dist. **Owner:** Mineral Center Mining Co. (1924-1951). Washington-Iowa Copper Mining Co. (1907-1918). **Ore:** Copper, lead, zinc, gold, silver. **Ref:** 33, 1908, p. 1414. 98, 1918-1926. 105, 1910, p. 63. 112, p. 209. 116, no. 1, 1907, p. 18.

### Way

(see Smith-Way)

### Wayside (63)

**Loc:** SE¼ sec. 8, (30-7E), 1½ mi. E. of Granite Falls. **Elev:** 1,200 to 1,500 ft. **Access:** 1½ mi. above the Yankee Boy property by road. 10 mi. from railroad at Hartford. **Prop:** 15 patented claims. **Owner:** Wayside Copper Co., Seattle, Wash. (1955—). Wayside Mining Co. (1905). American Copper Co. (1924). Riverside Minerals Co. (1928). Vanguard Metals, Inc., Everett, Wash. (1936-1939). F. G. DeShane, Seattle, Wash. (1943-1955). **Ore:** Copper, gold, silver, lead, zinc, vanadium. **Ore min:** Chalcopryrite, pyrite, galena, sphalerite, bornite. **Gangue:** Cherty quartz. **Deposit:** Vein 6 to 18 in. wide cutting slates and siliceous limestone. **Dev:** Shaft and 7 levels, 6 under water. **Assays:** 0.01 to 0.25 oz. Au, 6 to 10 oz. Ag, 10% Cu. The reported occurrence of vanadium has not been verified. **Prod:** About \$500,000 worth of high-grade ore shipped. **Ref:** 7-A, p. 17. 14, p. 13. 40, p. 37. 97, 1905, 1919, 1924, 1928. 104, 12/30/36, p. 29. 158.

### Wayside (Armament) (177)

(see Armament)

### Webster

(see Jasperson under gold)

### Weden Creek

(see Mackinaw)

**Westland (158)**

**Loc:** Sec. 7, (28-11E), on W. side of Silver Cr. **Prop:** 5 claims. **Ore:** Copper, gold, silver. **Ore min:** Pyrite, chalcopryrite, arsenopyrite. **Deposit:** One mineralized shear zone from 8 to 12 ft. wide exposed for 900 ft. A 20- to 30-ft. shear zone with 10 ft. of concentrating ore. A 4-ft. mineralized shear zone exposed for 300 ft. **Dev:** 47-ft. adit, 10-ft. adit, 50-ft. adit. **Assays:** \$18 and \$36. **Ref:** 14, p. 38. 63, p. 32.

**Whaleback (128)**

(see under gold)

**Whistler (90)**

(see under lead)

**White Gander (8)**

**Loc:** NW¼ sec. 34, (32-9E), Darrington dist. **Prop:** 2 claims. **Owner:** Messrs. Burns and Neste (1901). **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, arsenopyrite. **Deposit:** 3 ft. of ore. **Dev:** 15-ft. adit, two open cuts. **Assays:** \$15 to \$20 per ton. **Ref:** 14, p. 11. 63, p. 51. 88, p. 63.

**Whitehorse (1)**

(see under zinc)

**Wilbur Index**

(see Lake Serene)

**Wild Rose (133)**

**Loc:** Sec. 32, (29-11E), on Silver Cr. about 200 yd. upstream from Molybdenum Gulch. **Elev:** 3,000 ft. **Owner:** Bonanza Mining Co. (1901). **Ore:** Copper, mercury, cobalt, arsenic, nickel, gold, silver. **Deposit:** Rusty mineralized zone along contact of peridotite with slaty quartzite. **Dev:** Adit. **Ref:** 58, p. 73. 149, p. 830.

**Winnie (127)**

**Loc:** Sec. 31, (29-11E), just E. of the National prospect, Silver Cr. dist. **Owner:** E. H. Hubbard et al. (1892). **Ore:** Copper, gold, silver. **Ore min:** Pyrite, chalcopryrite. **Deposit:** 8-ft. shear zone with 4 ft. of ore. **Dev:** 10-ft. shaft. **Assays:** \$56 Au, Ag. **Ref:** 13, p. 161. 14, p. 38.

**Winter Coon (38)**

(see under gold)

**Yankee Boy (65)**

**Loc:** NE¼ sec. 18, (30-7E), 0.9 mi. E. of Granite Falls. **Access:** 9 mi. from railroad at Hartford. **Owner:** Orie Smith, Everett, Wash. (1949). Stilaguamish Mining Co. (1930-1931). Yankee Boy Mining Co. (1932-1933). Miners Smelting & Refining Co. (1934). **Ore:** Copper, gold, lead, zinc. **Ore min:** Malachite, sphalerite, pyrite, galena. **Gangue:** Quartz, calcite. **Deposit:** Shear zone in limestone and serpentine contains a few quartz and calcite stringers and is stained with malachite. Some sphalerite in the ore. **Dev:** 300-ft. adit along the shear zone. **Ref:** 14, p. 13. 79, 97, 1930, p. 675. 104, 9/15/32, p. 29; 10/15/33, p. 18; 4/30/34, pp. 21-22. 106, 3/5/31. 111, p. 7. 158.

**Zeta (134)**

(see under gold)

**STEVENS COUNTY****A and C (Smoky Bullion, Bruce Creek) (106)**

**Loc:** NE¼ sec. 3, (37-39E), on divide between Clugston Cr. and the E. branch of Bruce Cr., Northport dist. **Elev:** 3,450 ft. **Access:** Road. **Prop:** 160-acre State lease. **Owner:** E. B. Gibbs, Colville, Wash., lessee, (1944). J. D. McDonald and William Hammel, Colville, Wash., lessees, (1941). **Ore:** Copper, zinc, lead, silver, gold. **Ore min:** Chalcopryrite, sphalerite, pyrite, galena. **Gangue:** Limestone. **Deposit:** Ore minerals replace

limestone in a zone 2 to 12 ft. wide, 6 ft. from a granite contact. **Dev:** 220-ft. adit and a 110-ft. adit from which there has been some drifting. Also a shaft and open cut. **Assays:** 96 tons produced in 1941 yielded \$1,919. **Prod:** 1941 (96 tons), 1943, 1944. **Ref:** 30, p. 83. 46, p. 52. 164, pp. 241-242.

**Abe Lincoln (22)**

(see under gold)

**Acme (128)**

(see under lead)

**Admiral (193)**

**Loc:** NW¼ sec. 28 and NE¼ sec. 29, (31-39E), near junction of Deer and Meadow Creeks, Chewelah dist. **Access:** 12 mi. by road W. of Valley. ¼ mi. E. of the County road by truck road. **Prop:** 8 claims. **Owner:** Admiral Consolidated Mining Co., Spokane, Wash. (1918-1934). Phillip Creasor (1896-1900). Tate and Greenway (1900-1916). Admiral Mining Co. (1916-1918). **Ore:** Copper, silver, lead. **Ore min:** Chalcopryrite, chalcocite, tenorite. **Deposit:** A quartz vein as much as 14 in. wide parallels the lamination of schist. A diorite dike intrudes the schist nearby. **Dev:** 3 adits, several open cuts and shallow shafts total about 6,000 ft. of underground workings. **Assays:** 4.5% to 6.6% Cu, 2.5 to 4.5 oz. Ag, up to 0.04 oz. Au. **Prod:** 1915, 1916, 1930, 1932. Total probably \$10,000. **Ref:** 30, p. 32. 58, p. 2. 97, 1916, p. 616; 1917, p. 507. 98, 1918-1926. 104, 5/15/32, p. 26; 7/15/33, p. 19. 105, 1922, p. 276. 106, no. 14, 1924, p. 3; 11/6/30, 5/15/32, p. 26. 112, 1918, p. 163. 117, no. 13, 1917, p. 4. 141, p. 22. 164, pp. 182-184.

**Aguila (129)**

(see under lead)

**Aichan Bee (212)**

(see under silver)

**Aladdin (116)**

(see under lead)

**Aladdin (Blue Ridge, Sierra Zinc)**

(see Sierra Zinc under zinc)

**Alandale (185)**

**Loc:** Sec. 36, (33-39E), Chewelah dist. **Elev:** 2,600 to 2,680 ft. **Access:** Road. **Prop:** 4 unpatented claims. **Owner:** James Platt, Bluecreek, Wash. (1941). **Ore:** Copper. **Ore min:** Chalcopryrite, secondary copper minerals. **Gangue:** Quartz. **Deposit:** Argillite and schist cut by quartz veins. At least two veins, both of which are 4 ft. wide. **Dev:** 570-ft. adit, 83-ft. adit, 40-ft. adit, 110-ft. shaft. **Ref:** 30, p. 42. 164, pp. 165-166.

**Alberta (213)**

**Loc:** Sec. 3, (28-37E). **Access:** ½ mi. E. of road. **Prop:** Indian Reservation land leased by James Keith, Spokane, Wash. (1943). **Ore:** Copper, silver. **Ore min:** Malachite. **Gangue:** Quartz. **Deposit:** Slightly mineralized zone exposed for 1,500 ft., part of which is at argillite-granite contact. **Dev:** 2 shallow shafts. **Assays:** Owner reports one sample showed 3.3% Cu, 1 oz. Ag. **Ref:** 157.

**Alert**

(see under gold)

**Alice**

**Loc:** Chewelah dist. **Owner:** Alice Gold Mining Co. (1903-1908). **Ore:** Copper, silver, gold. **Ref:** 158.

**Amazon (143)**

(see also Chinto)

**Loc:** Secs. 29 and 32, (33-41E), Chewelah dist. **Prop:** 3 patented claims. Part of Chinto property. **Owner:** Chewelah Copper Co., Colville, Wash. (1953—). Amazon Mining Co.

(1918-1926). United Mines Corp. (1926). B. Oppenheimer, c/o A. I. Kulzer, Chewelah, Wash. (1950). **Ore:** Copper, silver, gold. **Ore min:** Chalcopyrite, azurite, limonite. **Deposit:** Quartz vein 2 to 16 ft. wide along bedding faults in argillite. **Dev:** 650 ft. of tunnel work and 310 ft. of drifts. **Improv:** 200-ton flotation mill at Palmers (1955). **Assays:** Values said to be 2½% Cu, 2 to 37 oz. Ag, 50¢ to 60¢ Au. 2 cars of oxide ore yielded \$841 Cu and \$125 Ag. **Prod:** \$6,212 to 1914. 1915-1917. 2,000 tons of ore from this and United Copper claim in 1954. 1955. **Ref:** 158. 164, pp. 150-151.

#### American Boy (95)

(see under gold)

#### Anaconda (55)

(see under lead)

#### Antelope (75)

(see under gold)

#### Ark (125)

(see under silver)

#### Audrey M. (94)

**Loc:** Sec. 31, (39-37E), between Orient and Copper Butte properties, Orient dist. **Prop:** 1 unpatented claim. **Owner:** Abandoned (1941). **Ore:** Copper, gold. **Ore min:** Chalcopyrite, pyrrhotite, pyrite. **Deposit:** Calcareous argillite and quartzite cut by monzonite dikes. A fracture zone in the series is mineralized with pyrite, pyrrhotite, and chalcopyrite. **Dev:** 18-ft. shaft, open cuts. **Assays:** Reportedly \$23 Cu, Au. **Ref:** 30, p. 131. 164, p. 268.

#### Austin

(see Aichan Bee under silver)

#### Avondale-Dome (111)

(see under lead)

#### B and B (176)

**Loc:** SW¼ sec. 32 or NE¼ sec. 31, (32-40E), ½ mi. SE. of Browns Lk. **Access:** 11 mi. by road SW. of Chewelah. **Prop:** 40 acres of deeded land. **Owner:** Henry Brosier (1941). **Ore:** Copper, gold, silver. **Ore min:** Cuprite, malachite, azurite. **Gangue:** Quartz, calcite, limonite. **Deposit:** Quartz-calcite vein in dolomite. **Dev:** 28-ft. crosscut adit from which a 42-ft. drift has been driven. Stopped 30 ft. to surface. **Prod:** 1917. **Ref:** 30, pp. 43-44. 97, 1917, p. 505. 164, pp. 185-186.

#### Bald Eagle (11)

(see under gold)

#### Banner

(see Chinto)

#### Banshee (171)

**Loc:** Secs. 22 and 27, (31-41E), Chewelah dist. **Owner:** Admiral Mining Co. (1915). **Ore:** Copper, silver, lead. **Prod:** 1907, 1910. **Ref:** 97, 1908, p. 581; 1911, p. 788.

#### Baxter

(see Snyder and Baxter under silver)

#### Bear Canyon (134)

**Loc:** NW¼ sec. 12, (34-40E), Chewelah dist. **Access:** Poor road. **Prop:** Several claims. **Ore:** Copper, silver. **Deposit:** Quartz vein. **Dev:** 800 ft. of shaft and adit. **Ref:** 30, p. 41.

#### Beecher (20)

(see under gold)

#### Belcher (141)

**Loc:** Sec. 33, (33-41E), on W. spur of Eagle Mtn., Chewelah dist. **Elev:** 2,900 ft. **Access:** Road. **Prop:** 7 claims, now part of Chinto mine. **Owner:** Eagle Mountain Mining Co. (1949).

Belcher Group Development Co. (1908). **Ore:** Copper, lead, silver, gold. **Ore min:** Chalcopyrite, chalcocite, galena. **Gangue:** Quartz, siderite. **Deposit:** Quartz veins cutting a series of lime-stones and argillites. One vein is 4 ft. wide and carries chalcocite and chalcopyrite. The others are 3 in. to 6 ft. wide, one carries galena. **Dev:** 420-ft. adit, 135-ft. shaft, 12-ft. shaft, other short adits and shafts. **Ref:** 30, p. 39. 116, no. 6, 1908, p. 122. 164, pp. 146-147.

#### Benvenue

(see Gold Reef under gold)

#### Big Bear (119)

**Loc:** NE¼ sec. 4, (36-38E), on N. side of Pingstone Cr. Kettle Falls dist. **Elev:** 2,630 ft. **Access:** 5 mi. from Marcus. **Prop:** 1 claim, abandoned during 1941. **Ore:** Copper. **Deposit:** Quartz stringer in argillite. **Dev:** 300-ft. adit, 195-ft. adit from which a 105-ft. shaft has been sunk. **Ref:** 30, p. 56. 164, p. 232.

#### Big Iron (38)

(see under iron)

#### Big Jim (71)

(see under gold)

#### Birton

(see under gold)

#### Black Horse

(see Columbia Tungsten under tungsten)

#### Blanche

(see under silver)

#### Bland

(see under lead)

#### Bliss

(see Galena Hill under lead)

#### Blue Bird (72)

(see under gold)

#### Blue Creek

**Loc:** About 1½ mi. from the station of Blue Creek on the Great Northern Ry., Chewelah dist. **Prop:** 3 claims. **Owner:** Blue Creek Copper Mining Co. (1902-1908). **Ore:** Copper. **Deposit:** 6-ft. vein. **Dev:** 300 ft. of underground workings. **Assays:** \$26.76 Cu. **Ref:** 33, 1908, p. 383. 88, p. 7.

#### Blue Goose (25)

**Loc:** Sec. 29, (40-37E), Orient dist. **Prop:** 1 unpatented claim. **Owner:** Abandoned (1941). **Ore:** Copper, gold. **Ore min:** Pyrite and subordinate chalcopyrite. **Gangue:** Quartz. **Deposit:** Mineralized vein along quartzite-brecciated limestone contact. **Dev:** Small open cuts. **Ref:** 30, p. 124. 164, p. 281.

#### Blue Grass (89)

(see under gold)

#### Blue Ridge

(see Sierra Zinc under zinc)

#### Blue Star

(see Eagle under silver)

#### Bluebird

(see Loon Lake Copper)

#### Bonanza (102)

(see under lead)

#### Bonanza Copper (Maryland) (202)

**Loc:** Sec. 32, (30-38E), about 1 mi. N. of the Germania mine, Cedar Canyon dist. **Access:** On the old Deer Trail road near summit of the Huckleberry Range. **Prop:** Several unpatented claims. **Owner:** Bonanza Copper Co. (1916-1941). **Ore:** Copper,

reportedly silver and gold. **Ore min:** Chalcopyrite, bornite, malachite, pyrite. **Gangue:** Quartz, calcite. **Deposit:** Zones in argillite and schist have been replaced by mineralized quartz veinlets. Widest zone was 5 ft. Quartz veinlets vary from a few in. to 2 ft. in width. **Dev:** 2 adits with drifts comprise 1,200 ft. of underground workings. **Prod:** One small shipment in 1916. **Ref:** 30, p. 74. 97, 1916, p. 616. 129, pp. 151-152. 158.

#### Boundary Line (1)

**Loc:** SE¼NE¼ sec. 2, (40-36E), on E. side of Kettle R. near international boundary line, Orient dist. **Elev:** 1,500 ft. **Ore:** Copper. **Ore min:** Pyrite, chalcopyrite. **Deposit:** Argillite exposed for about 300 ft. along the river is mineralized with pyrite and chalcopyrite. **Ref:** 158.

#### Brooks (209)

(see under silver)

#### Brown's Lake (177)

**Loc:** NW¼ sec. 30, (32-40E), Chewelah dist. **Ore:** Copper. **Prod:** 1916, 1917. **Ref:** 97, 1917, p. 505; 1918, pp. 508-509.

#### Bruce Creek

(see A and C)

#### Bryant (17)

**Loc:** SW¼ sec. 36, (40-36E), Orient dist., ½ mi. NE. of Rockcut. **Elev:** 2,120 ft. **Prop:** 1 unpatented claim. **Owner:** George Bryant, Orient, Wash. (1941). **Ore:** Copper, gold. **Ore min:** Chalcopyrite. **Deposit:** Gneiss, cut by serpentinized basic dikes, is traversed by fracture zones which have been slightly mineralized. **Dev:** 30-ft. adit, 125-ft. adit, 85-ft. shaft, 12-ft. shaft, and some open cuts. **Ref:** 30, p. 130. 164, p. 290.

#### Buck Mountain

(see under silver)

#### Bullion (66)

(see under lead)

#### Burrus (115)

(see under zinc)

#### Centennial (78)

**Loc:** Sec. 19, (39-38E). Adjoins the Minorca claim on NE., Orient dist. **Prop:** 1 claim. **Owner:** Centennial Mines Co. (1924-1926). Minorca-Homestake Mines Co. (1922). **Ore:** Copper, gold, silver. **Ore min:** Chalcopyrite, pyrrhotite, arsenopyrite. **Gangue:** Quartz. **Deposit:** Limestone and argillite are cut by an andesite dike. A 4-ft. quartz vein follows the limestone-andesite contact. Other smaller veins nearby. **Dev:** 65-ft. inclined shaft. **Assays:** \$38 Cu, Au, Ag. **Ref:** 63, p. 107. 98, 1925, p. 1808; 1926, p. 1573. 106, no. 2, 1924, p. 8. 164, p. 255.

#### Chamokane (198)

**Loc:** Secs. 9, 10, 11, and 15, (30-38E), near headwaters of Chamokane Cr., Cedar Canyon dist. **Access:** Road from Springdale. **Prop:** 38 claims, believed abandoned (1941). **Owner:** Security Copper Co. (1918-1926). **Ore:** Copper. **Ore min:** Chalcopyrite, pyrite. **Gangue:** Quartz, barite. **Deposit:** 3 main quartz veins in argillite. Two 4-ft. and one 18-in. vein along bedding planes in argillite. **Dev:** 50-ft. adit, 170-ft. adit, several open cuts. **Ref:** 30, p. 73. 98, 1918-1926. 164, pp. 211-212.

#### Checops (Sprague) (179)

**Loc:** Sec. 24, (32-39E), Chewelah dist. Adjoins Pacific Copper on the W. **Elev:** 2,950 ft. **Access:** Road. **Prop:** 80 acres of deeded land. **Owner:** Northwest Magnesite Co., Chewelah, Wash. (1941). Checops Copper Mining Co. (1920). **Ore:** Copper, gold. **Ore min:** Chalcopyrite, limonite. **Gangue:** Quartz, calcite, siderite. **Deposit:** Quartz-calcite-siderite vein cutting series of quartzites and argillites intruded by diabase. **Dev:** 200-ft. adit, shaft, short adit. **Ref:** 30, p. 43. 112, p. 172. 164, p. 167.

#### Chewelah Consolidated (135)

(see under lead)

#### Chewelah Eagle

(see Eagle under silver)

#### Chewelah Standard (Nellie S.) (159)

**Loc:** N. part sec. 7, (32-41E), 1½ mi. E. of Chewelah. **Prop:** 5 claims. **Owner:** Chewelah Standard Mining Co., Spokane, Wash. (1916-1920). **Ore:** Copper, silver, gold, molybdenum. **Ore min:** Chalcopyrite, molybdenite. **Deposit:** 3 quartz veins, one along contact of schist and granite, the others in granite. Ore minerals occur in the quartz and associated pegmatite dikes. **Dev:** 60-ft. shaft, 30-ft. shaft, adit. **Assays:** Ore shipped to smelter returned \$6 Au, Ag. **Prod:** 1 carload of ore shipped in 1915. **Ref:** 97, 1916, p. 614. 164, pp. 156-157.

#### Chinto (Banner) (144)

(includes Amazon, Copper King, and Independent Keystone, which see)

**Loc:** Near center N½ sec. 32, (33-41E). **Elev:** 3,040 ft. **Access:** 6 mi. by road to railroad at Chewelah. **Prop:** 3 patented, 11 unpatented claims, and 1 millsite. **Owner:** Eagle Mountain Mining Co. (1949). Chinto Mining Co. (1938-1944). **Ore:** Copper, silver, gold. **Ore min:** Chalcopyrite, tetrahedrite, sphalerite, pyrite, arsenopyrite, malachite, azurite. **Gangue:** Quartz, calcite, siderite. **Deposit:** Several quartz-calcite-siderite veins along faults parallel to bedding in argillite. Ore occurs as lenses and disseminations, also disseminated in the argillite. **Dev:** 1,500-ft. adit, 350-ft. shaft, total 7,000 ft. of workings on 3 levels. **Improv:** 25-ton flotation mill (1940). **Assays:** Ore produced from upper two levels av. \$12.59 Ag, Cu, Au. 8 cars of sorted crude ore ran 12% to 15% Cu, 80 oz. Ag. **Prod:** Copper King 1904, 1909, 1912-1913, 1915-1917. Amazon 1910, 1915-1917. Chinto 1938, 1939 (130 tons), 1940 (8 cars crude ore, 400 tons conc.), 1941 (1,587 tons). Total production is probably about 50,000 tons of ore. **Ref:** 7, pp. 102-104. 13, p. 156. 30, p. 31. 33, 1907, p. 473; 1908, p. 521. 97, 1905, 1910, 1911, 1913, 1914, 1916, 1917, 1918, 1930, 1939-1941. 98, 1918-1926. 112, pp. 165, 172, 187. 114, no. 5, 1909, p. 57. 116, no. 9, 1907, p. 18. 117, no. 1, 1922, p. 41. 129, pp. 131-135. 158. 164, pp. 142-144, 150-151. 164-A, p. 123.

#### Chloride Queen (110)

(see under lead)

#### Churchill (39)

**Loc:** Sec. 30, (40-38E), Orient dist. **Access:** Near road. **Prop:** Several unpatented claims. **Owner:** Mr. Powell, Northport, Wash. (1941). **Ore:** Copper, gold. **Gangue:** Quartz, talc. **Deposit:** Mineralized zone about 8 ft. in width. **Dev:** Shaft with 300 ft. of work. **Ref:** 30, p. 136. 63, p. 107.

#### City View (124)

(see under gold)

#### Clara (53)

(see under gold)

#### Clugston

(see Silver Trail under lead)

#### Coffer (Copper-Gold) (87)

**Loc:** Sec. 28, (39-37E), on E. side of the Elmo claim on W. slope of Jumbo Mtn., Orient dist. **Elev:** 2,865 ft. **Prop:** 1 claim. **Owner:** Abandoned (1941). **Ore:** Copper, lead, gold. **Ore min:** Pyrite, chalcopyrite, galena. **Deposit:** Fracture zones in argillite slightly mineralized. **Dev:** 300-ft. adit with 60-ft. inclined shaft and 40-ft. drift at face. Also open cuts. **Ref:** 30, p. 134. 164, p. 273.

#### Columbia

(see Iroquois under zinc)

**Columbia River (122)**

**Loc:** NE¼ sec. 7 or NW¼ sec. 8, (36-38E). **Elev:** 1,675 to 2,525 ft. **Access:** 3 mi. SE. of Marcus by road. **Prop:** 2 claims. **Owner:** Columbia River Gold Mining Co. (1905-1914). Abandoned (1941). **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, pyrite, tetrahedrite, molybdenite. **Gangue:** Quartz, calcite, siderite. **Deposit:** Vein 3 to 6 ft. wide in shale and limestone consists of brecciated country rock cemented by gangue minerals. Ore shoots as much as several in. wide and several ft. long. **Dev:** 2,700-ft. adit and several laterals at 1,675 ft. Inclined shaft said to be 300 ft. deep at elev. of 2,525 ft. **Prod:** Small production in 1904 and 1910 valued at \$1,500. **Ref:** 7, pp. 124-125. 30, pp. 56-57. 33, 1907, p. 490; 1908, p. 544. 97, 1905, p. 337; 1910, p. 605. 158. 164, pp. 233-234.

**Columbia Tungsten (188)**

(see under tungsten)

**Colville Queen**

(see Chloride Queen under lead)

**Comstock (9)**

**Loc:** W½ sec. 25 and E½ sec. 26, (40-36E), a short distance E. of Kettle R., Orient dist. **Prop:** 4 claims: Comstock, Homestake, Red Fox, Red Cross. **Ore:** Copper, silver, gold. **Ore min:** Chalcopryrite, pyrrhotite, galena. **Deposit:** Country rock is quartzite and gneissoid granite. The ore occurs in a 5-ft. mineralized zone and 2 quartz veins 4 and 6 ft. wide. **Dev:** 15-ft., 30-ft., 64-ft. shafts, 60-ft. adit. **Assays:** Mineralized zone \$5 to \$35 Au, Cu, Ag. 6-ft. vein, 3½% Cu, 22 oz. Ag, \$1.30 Au. **Ref:** 164, pp. 288-289.

**Contention**

(see Mountain View under silver)

**Copper Butte**

**Loc:** Orient dist. **Ore:** Copper. **Ore min:** Chalcopryrite, pyrite, limonite. **Deposit:** Mineralized fracture zone 4 ft. wide in limestone near contact with an aplite dike. **Dev:** 2 shafts, one 90 ft. deep. **Ref:** 114, no. 5, 1909, p. 61. 164, p. 281.

**Copper Butte (97)**

**Loc:** SE¼ sec. 31, (39-37E), 3 mi. SE. of Orient, on SW. slope of Toulou Mtn., less than ½ mi. NE. of Globe prospect. **Elev:** 1,800 to 2,930 ft. **Access:** Road. **Prop:** 4 patented claims. **Owner:** B. B. Hamilton, Orient, Wash. (1941). Copper Butte Mining Co. (1915). **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, bornite, pyrite. **Gangue:** Quartz. **Deposit:** Mineralized breccia and gouge along a fault in quartzite, argillite, and limestone near contact with monzonite. **Dev:** 1,200-ft. crosscut adit, 300-ft. shaft with short drifts on 3 levels, 100-ft. shaft with a 100-ft. drift. **Assays:** Specimen assays said to run \$15 to \$18 Au. **Ref:** 7, p. 79. 30, p. 125. 164, pp. 267-268.

**Copper Butte (Shallenberger) (196)**

**Loc:** SW. cor. sec. 11 and NW¼ sec. 14, (30-38E), Springdale area. **Elev:** 3,610 ft. **Access:** Road. **Prop:** 4 unpatented claims. **Owner:** H. H. Shallenberger, Spokane, Wash., leasing to Earl Fields et al. (1942). Security Copper Co. (1918-1926). **Ore:** Copper. **Ore min:** Chalcopryrite, bornite, pyrrhotite, pyrite. **Gangue:** Quartz, barite. **Deposit:** Barite vein 4 to 6 ft. wide along the laminations of argillite contains sparsely disseminated ore minerals. **Dev:** 180-ft. adit with winze at face said to be 150 ft. deep, open cuts. **Assays:** Ore shipped av. 3.8% Cu. **Prod:** 5 cars. Several hundred tons of barite is reported to have been produced. **Ref:** 30, p. 63. 97, 1916, p. 616; 1917, p. 507. 98, 1918-1926. 157. 164, pp. 209-210.

**Copper Cliff (167)**

**Loc:** SE¼ sec. 17, (32-41E), Chewelah dist. **Owner:** Copper Cliff Copper Mining Co. (1917-1924). **Ore:** Copper. **Ref:** 158.

**Copper-Gold**

(see Coffer)

**Copper Jack (26)**

**Loc:** Secs. 29 and 32, (40-37E), Orient dist., about 4 mi. E. of Rockcut. **Prop:** 3 unpatented claims. **Owner:** Abandoned (1941). Northwestern Gold & Copper Mining Co. (1918). **Ore:** Copper, gold. **Ore min:** Chalcopryrite and a little pyrite. **Gangue:** Quartz. **Deposit:** A 1-ft. vein. **Dev:** 25-ft. and 10-ft. shafts. **Ref:** 30, p. 126. 112, p. 195. 164, p. 278.

**Copper King (145)**

(see also Chinto)

**Loc:** Sec. 32, (33-41E), Chewelah dist. **Elev:** 3,041 to 3,330 ft. **Prop:** Part of Chinto property. **Owner:** Banner Mining Co. (1950). Copper King Mining Co. (1905-1907, 1920-1924). Chewelah Copper King Mining Co. (1907-1915). United Copper Co. (1916-1918). Copper Queen Mining Co. (1918). King Mining Co. (1918). United Mines Corp. (1926). Northwest Mines Corp. (1930). **Ore:** Copper, silver. **Deposit:** Said to be a body of low-grade ore 40 ft. wide and 500 ft. long. **Dev:** Shaft, short intermediate level, and lower adit 1,160 ft. long. **Assays:** 4,000 tons from No. 2 level av. 2½% Cu, 3 oz. Ag, \$1.00 Au. Low-grade ore remaining showed an av. of 0.32% Cu, 0.21 oz. Ag in 8 samples. **Prod:** 1904, 1909, 1912, 1913, 1915-1917. **Ref:** 158.

**Copper King (56)**

(see under lead)

**Copper Queen (137)**

**Loc:** Sec. 6, (33-41E), on Chewelah Cr. **Elev:** 2,300 to 2,500 ft. **Access:** 10 mi. N. of Chewelah by road. **Prop:** 5 claims: Silver Tip, West Side, Black Bear, Ellis G., Mary L. **Owner:** R. C. Thomason, Chewelah, Wash. (1950). **Ore:** Copper, silver. **Ore min:** Pyrite, chalcopryrite, tetrahedrite. **Gangue:** Quartz, calcite. **Deposit:** Small lenticular and irregularly spaced quartz veins in quartzite and conglomerate. Veins sparsely mineralized, as is the calcite cement in the conglomerate. **Dev:** Several short adits, drifts, and winzes aggregate about 600 ft. of underground development. **Ref:** 7, pp. 108-109.

**Copper Queen (147)**

**Loc:** SW¼ sec. 29, (33-41E), on Eagle Mtn. **Elev:** 2,800 ft. **Access:** 7 mi. NE. of Chewelah. **Prop:** 2 claims and 80 acres of deeded land. **Owner:** Mr. Durkee, Chewelah, Wash. (1950). Aurora Mining Co. (1915). Northwestern Gold & Copper Mining Co. (1918). Copper Queen Mining Co. (1918). Aurora Copper Mining Co. (1918-1924). United Mines Corp. (1926). Northwest Mines Corp. (1930). **Ore:** Copper, silver, gold, lead. **Ore min:** Chalcopryrite. **Gangue:** Quartz, siderite. **Deposit:** 4-ft. quartz-siderite vein in argillite. 600 ft. from portal of the main adit. **Dev:** 3 crosscut adits total 1,200 ft. in length. **Assays:** Low-grade ore. **Prod:** Has produced. **Ref:** 30, p. 32. 58. 97, 1930, p. 675. 98, 1918-1926. 112, p. 167. 164, p. 144.

**Coyote**

(see Rightside)

**Crescent**

(see Orient, Crescent, and Deadwood)

**Daisy**

(see Daisy-Tempest under silver)

**Daisy-Tempest (131)**

(see under silver)

**Dead Medicine**

(see Silver Trail under lead)

**Deadwood**

(see Orient, Crescent, and Deadwood)

**Deer Trail (207)**

(see under silver)

**Deer Trail Monitor (200)**

(see under molybdenum)

**Defender (92)**

(see under zinc)

**Delmonico**

(see Jay Dee under silver)

**Denver (194)**

**Loc:** E½ sec. 29, (31-39E), on Deer Cr., W. of Admiral property. **Elev:** 3,100 ft. **Owner:** Denver Copper Mining Co. (1920). Abandoned (1941). **Ore:** Copper. **Ore min:** Chalcopryrite. **Deposit:** Quartz vein parallels the lamination of schist. Some chalcopryrite in the schist as well as in the quartz. **Dev:** 15-ft. shaft, 65-ft. crosscut adit. **Assays:** 5% to 9% Cu. **Ref:** 30, p. 46. 112, p. 176. 164, p. 184.

**Detroit**

(see Wabash-Detroit)

**Diamond C (161)**

**Loc:** SW¼ sec. 7, (32-41E), 2 mi. E. of Chewelah. **Elev:** 2,540 ft. **Prop:** 1 patented claim. **Owner:** Lee Potter, Yelm, Wash. (1941). **Ore:** Copper. **Ore min:** Chalcopryrite, pyrite. **Gangue:** Quartz. **Deposit:** Ore-bearing quartz stringers in an 8-ft. granitic dike cutting argillite. **Dev:** 39-ft. inclined shaft. **Ref:** 30, pp. 39-40. 164, pp. 157-158.

**Dille**

(see Pelkey and Dille)

**Dora**

(see Acme under lead)

**Double Eagle (192)**

(see under lead)

**Double Standard (42)**

**Loc:** Near center N. line sec. 3, (40-39E). Within 700 ft. of international boundary, Northport dist. **Elev:** 2,200 ft. **Access:** Near road. **Prop:** Several unpatented claims. **Ore:** Copper, lead, zinc, silver, gold. **Ore min:** Pyrrhotite, chalcopryrite, galena, sphalerite. **Deposit:** Limestones and argillites cut by dikes. Mineralized quartz veins occur in the country rock and in one of the dikes. **Dev:** 810-ft. crosscut adit, short inclined shaft, and shallow winze in adit. **Ref:** 7, pp. 61-62. 30, p. 113. 58, p. 19. 164, pp. 317-318.

**Douglas**

(see under tungsten)

**E. M. C. (126)**

(see under lead)

**Eagle (153)**

(see under silver)

**Eagle-Newport**

(see Aguila under lead)

**Easter Sunday (35)**

(see under gold)

**Easy Money**

(see Magma under zinc)

**Edna (King) (190)**

**Loc:** SE¼SE¼ sec. 9 and sec. 10, (31-39E), 9 mi. W. and 1 mi. N. of Valley, Chewelah dist. **Elev:** 2,875 ft. **Access:** Road. **Prop:** 12 claims, including: Alpine, Log Cabin, Log Cabin Extension, Mother Lode, Gladiator. Most work on Gladiator. **Owner:** C. R. and J. M. Carr, Valley, Wash. (1953—). King

Gold & Copper Mining Co. (1902-1908). Valley Mining Co. of Spokane (1917-1924). Arthur L. Hooper, Spokane, Wash. (1941). **Ore:** Copper, silver, gold. **Ore min:** Chalcopryrite, pyrite, arsenopryrite, tetrahedrite, bornite, malachite, azurite, chalcocite, melaconite. **Gangue:** Quartz, siderite. **Deposit:** Old reports described an 80-ft. mineralized zone at contact of diorite and argillite with 4 ft. of shipping ore and 6 ft. of concentrating ore. Openings now accessible show an 8-in. quartz vein along foliation of argillite. 3 ledges, with shaft on middle ledge. Vein 4 ft. wide at 125-ft. depth. **Dev:** 30-ft. shaft, 450-ft. shaft with nearly 1,000 ft. of drifts, and several caved open cuts. Level 100 ft. long at 110-ft. depth in shaft, and a level 60 ft. long at 225-ft. depth. **Assays:** 150 tons av. 7% Cu, 4 oz. Ag, \$2.75 Au. 24 assays showed 3.60% to 45.36% Cu, tr. to \$14.50 Ag, tr. to \$20 Au; and the av. was about 20% Cu, \$1.00 Ag, \$3.00 Au. **Prod:** 1899, 1904-1906, 1917. Total about \$5,000. **Ref:** 30, pp. 46-47. 33, 1907, p. 721; 1908, pp. 846-847. 97, 1917, p. 507. 98, 1918-1925. 112, p. 208. 158. 164, pp. 181-182.

**Eldorado**

(see Magma under zinc)

**Electric Point (63)**

(see under lead)

**Elmo (88)**

**Loc:** Sec. 28, (39-37E), Orient dist. **Elev:** 3,280 ft. **Access:** 3 mi. from road. **Prop:** 1 unpatented claim. **Owner:** Abandoned (1941). **Ore:** Copper, gold. **Ore min:** Pyrite, chalcopryrite, malachite, limonite. **Gangue:** Calcite, quartz. **Deposit:** Argillite and greenstone cut by a 15-ft. mineralized zone. **Dev:** 15-ft. shaft, several open cuts. **Ref:** 30, p. 132. 164, p. 273.

**Enterprise**

(see under gold)

**Enterprise (Jay Dee)**

(see Jay Dee under silver)

**Eureka (3)**

(see under gold)

**Eureka and Orient**

(see Eureka under gold)

**Express**

(see St. Paul-Express)

**Fidelity (44)**

(see under gold)

**Finley**

(see under lead)

**Fish (127)**

(see under silver)

**Flannigan**

(see Iroquois under zinc)

**Frisco Standard (61)**

(see under silver)

**Galena Farm (105)**

(see under lead)

**Galena Hill (16)**

(see under lead)

**Georgic (84)**

**Loc:** Sec. 27, (39-37E), on W. slope of Jumbo Mtn., Orient dist. **Prop:** 1 unpatented claim. **Owner:** Abandoned (1941). **Ore:** Copper, lead, silver, gold. **Ore min:** Pyrite, chalcopryrite, galena. **Deposit:** Quartz-calcite vein in argillite. **Dev:** 84-ft. shaft, numerous open cuts. **Ref:** 30, p. 134. 164, pp. 273-274

**Giant Silver**

(see Red Cloud)

**Gillete**

(see Avondale-Dome under lead)

**Gladstone (64)**

(see under lead)

**Globe (98)**

**Loc:** Near SE, cor. sec. 31, (39-37E). **Elev:** 2,275 to 2,700 ft. **Access:** 3½ mi. SE. of Orient by road. **Prop:** 1 patented claim. **Owner:** B. B. Hamilton, Orient, Wash. (1941). **Ore:** Copper, gold, silver, zinc. **Ore min:** Pyrite, hematite, galena, chalcopryrite, pyrrhotite. **Gangue:** Calcite. **Deposit:** Ore occurs as stringers filling joint planes in argillite and limestone near contact with pyrite-bearing quartz latite. **Dev:** 3 adits, one with 900 ft. of workings; 50-ft. shaft. Total of 3,000 ft. **Assays:** Small values in copper and gold reported. **Ref:** 7, p. 78. 30, pp. 121-122. 116, no. 5, 1909, p. 61. 164, p. 267.

**Gold Bar (103)**

(see under gold)

**Gold Reef (121)**

(see under gold)

**Golden Reef**

(see Gold Reef under gold)

**Golden Seal**

**Loc:** Cedar Canyon dist. **Ore:** Copper. **Prod:** Amount not known. **Ref:** 97, 1917, p. 507; 1918, p. 511.

**Graves (83)**

**Loc:** SW¼SW¼ sec. 35, (39-37E), Orient dist. **Owner:** John and Robert Wagner, Boyds, Wash., leasing to Hugh I. Graves, Boyds, Wash. (1945.) **Ore:** Copper, gold, silver. **Ore min:** Pyrite, chalcopryrite, rhodochrosite (?). **Deposit:** Mineralized zone about 4 ft. wide along hanging wall of fault in greenstone. **Dev:** Trench. **Assays:** Low gold and silver values. **Ref:** 157.

**Gray Eagle**

(see Rightside)

**Great Republic (43)**

**Loc:** Near center N. line sec. 3, (40-39E), on E. side of Sheep Cr., Northport dist. **Elev:** 2,200 ft. **Access:** Near Velvet on State Highway No. 22. **Prop:** Several unpatented claims. **Owner:** Elmer Godfrey, Northport, Wash. (1941). **Ore:** Copper, silver, gold. **Ore min:** Chalcopryrite, pyrrhotite, galena, sphalerite. **Gangue:** Quartz, calcite. **Deposit:** Two main veins, one a quartz vein containing pyrrhotite, the other a quartz-calcite vein up to 4 ft. wide along contact between kersantite dike and limy shale. **Dev:** 400-ft. crosscut, 110-ft. winze, 120-ft. inclined shaft. **Assays:** Pyrrhotite vein assayed 11.25% Cu, 12 oz. Ag, \$2.40 Au. The other vein reported to assay 2.5% to 8.5% Cu, 19 oz. Ag, tr. to \$8 Au. **Ref:** 7, pp. 60-61. 30, pp. 113-114. 164, p. 318.

**Hartford**

(see Krug)

**Hecla (154)**

**Loc:** E½SW¼ sec. 4, (32-41E). **Access:** 3½ mi. NE. of Chewelah by road. **Prop:** 40 acres of deeded land. **Owner:** Tony Mally, Chewelah, Wash. (1941). Hecla Copper-Silver Mining & Milling Co. (1915-1920). International Mining & Metals Co. (1922). **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, azurite, malachite, cuprite, chalcocite, micaceous hematite, and some sphalerite, pyrite. **Deposit:** 4-ft. quartz vein in granite. Also smaller veins. **Dev:** 40-ft. crosscut; 100-ft. shaft

and another shaft, both full of water. **Ref:** 30, p. 41. 58, p. 29. 98, 1918-1925. 158. 164, p. 160.

**High Grade (Jay Dee)**

(see Jay Dee under silver)

**High Grade**

(see Turk)

**Highland Chief**

(see under silver)

**Homestake (73)**

(see under gold)

**Hoodoo (208)**

(see under silver)

**Hope and Twin Cabins (70)**

**Loc:** Sec. 18, (39-38E), Northport dist. **Elev:** 3,800 ft. **Prop:** 2 claims. **Ore:** Copper, gold, silver. **Ore min:** Pyrrhotite and some chalcopryrite. **Deposit:** Mineralized zone 7 ft. wide in acidic diorite dike rock intrusive into Jumbo volcanics. **Dev:** Two 30-ft. adits about 30 ft. apart, several open cuts and shallow shafts. **Assays:** Reported to av. \$9.20 Au, Cu, Ag. **Prod:** 100 tons said to have been shipped. **Ref:** 164, p. 253.

**Hubbard (45)**

(see under lead)

**Hunter**

(see Jackson under zinc)

**Imperial Copper (157)**

**Loc:** Sec. 6, (32-41E), in canyon on W. flank of Old Eagle Mtn., Chewelah dist. **Elev:** 2,800 ft. **Access:** ½ mi. from road. **Prop:** 6 unpatented claims, abandoned in 1941. **Ore:** Copper, silver. **Deposit:** One 4-ft. quartz vein encountered. Workings are in limestone near schist contact. **Dev:** 150-ft. shaft with 450-ft. crosscut at bottom. Also an adit near collar of the shaft. **Assays:** Tr. Cu. **Ref:** 30, p. 40. 58, p. 32. 164, pp. 147-148.

**Independent Keystone (Keystone, Strobeck) (152)**

(part of Chinto holdings, which see)

**Loc:** Near center sec. 32, (33-41E), Chewelah dist. **Access:** Road. **Prop:** 4 patented claims and a fraction. **Owner:** Chewelah Copper Co. leasing from Western Guaranty Co. and A. I. Kulzer, Chewelah, Wash. (1953—). Independent-Keystone Mining Co. (1907-1915). Eagle Mountain Mining Co. (1949). **Ore:** Copper. **Ore min:** Chalcopryrite. **Deposit:** Quartz vein follows bedding planes in argillite and schist. **Dev:** 700-ft. adit. **Ref:** 30, p. 37. 97, 1907, p. 476. 116, no. 1, 1907, p. 17; no. 6, 1908, p. 123. 158. 164, p. 145.

**Indian**

(see Eureka under gold)

**Inklers Point (175)**

**Loc:** SW¼NE¼ sec. 11, (31-40E), on hill above Inklers Point, Chewelah dist. **Elev:** 2,000 ft. **Ore:** Copper. **Ore min:** Chalcopryrite. **Gangue:** Dolomite. **Deposit:** A few scattered crystals of chalcopryrite occur in dolomite near a fault. **Ref:** 158.

**International (23)**

(see under gold)

**Iron Horse**

(see under gold)

**Iron Horse (32)**

(see under iron)

**Iron Mask (12)**

(see under zinc)

**Iroquois (58)**

(see under zinc)

**Jackson (54)**

(see under zinc)

**Jay Dee (150)**

(see under silver)

**Jay Gould (156)**

(see under silver)

**Jayhawker (37)**

**Loc:** NE¼ sec. 22, (40-37E). ¼ mi. NE. of Easter Sunday property, Orient dist. **Prop:** 1 patented claim. **Owner:** Macy Forsyth, Orient, Wash. (1941). **Ore:** Copper, gold, silver, lead. **Ore min:** Pyrite, chalcopryrite. **Deposit:** Massive quartz vein in argillite and quartzite contains pyrite and a little chalcopryrite. **Dev:** Inclined shaft and several other shallow shafts and open cuts. **Ref:** 30, p. 126. 58, p. 34. 164, p. 277.

**Jim Dandy (146)**

**Loc:** NE¼ sec. 32, (33-41E), Chewelah dist. **Access:** ½ mi. from road. **Prop:** 4 claims, including the Sunset and Express Fraction. **Owner:** United Copper Co. (1941). **Ore:** Copper. **Ore min:** Chalcopryrite. **Deposit:** A small amount of chalcopryrite occurs in a series of argillites, limestone, and schist. Apparently no vein was encountered. **Dev:** 325-ft. crosscut adit from which a 158-ft. drift and a 300-ft. crosscut have been driven. Also a 200-ft. adit. **Ref:** 30, p. 40. 164, p. 145.

**John Day (149)**

(see under silver)

**John Hays (130)**

(see under silver)

**Juno-Echo (Western Molybdenum) (160)**

**Loc:** Center N½ sec. 7, (32-41E). **Elev:** 2,100 ft. **Access:** About 2 mi. from railroad at Chewelah. **Prop:** 6 patented claims: Echo, Ibex, Juno, N. I. T., Jungle, Single Standard; and 2 unpatented claims. **Owner:** Western Molybdenum Corp., Spokane, Wash. (1938-1943). June Echo Mining & Milling Co. (1915-1920). June Copper Co. (1918). Juno-Echo Copper Co. (1918-1926). **Ore:** Copper, molybdenum, tungsten, silver, gold. **Ore min:** Chalcopryrite, pyrite, molybdenite, scheelite, arsenopyrite. **Deposit:** Lenticular quartz veins from a fraction of an in. to 4 ft. wide along contact of limestone and monzonite. **Dev:** Working shaft 292 ft. deep, 850 ft. of drifts and raises, 3 inaccessible shafts of unknown depth, 2 adits 165 ft. and 50 ft. long, and numerous open cuts. **Assays:** 0.09% to 3.12% Cu, 0.32% to 1.48% MoS<sub>3</sub>, 0.20% WO<sub>3</sub>, 0.75 oz. Ag, tr. Au. 47 tons ore shipped av. 2.4% Cu, 0.004 oz. Au, 0.19 oz. Ag. Samples across minable widths of the vein av. 0.95% Cu, 0.12% WO<sub>3</sub>, 0.44% Mo. **Prod:** 47 tons of ore 1916, 3 carloads of ore 1917. In 1941, 300 to 400 tons were mined and milled for MoS<sub>3</sub>, but conc. did not meet market specifications. **Ref:** 30, p. 30. 37, p. 71. 97, 1916, p. 614. 98, 1918-1926. 112, p. 185. 113, 2/4/37, p. 7. 117, no. 1, 1922, p. 41. 130, p. 82. 133-B, pp. 73-86. 157. 158. 164, pp. 153-154.

**Katy**

(see Blue Grass under gold)

**Kemp-Komar**

(see Loon Lake Copper)

**Keough (62)**

(see under lead)

**Kettle River (Galena Hill)**

(see Galena Hill under lead)

**Kettle River (White Elephant)**

(see White Elephant under gold)

**Key West**

(see Loon Lake Copper)

**Keystone**

(see Independent Keystone)

**King**

(see Edna)

**Koyotte**

(see Rightside)

**Krug (Hartford) (186)**

**Loc:** NE¼SE¼ sec. 26, (33-39E). **Elev:** 2,300 to 2,500 ft. **Access:** 1½ mi. NW. of Bluecreek by road. **Prop:** 10 claims: Saturn, Jupiter, Morning Star, Hartford, Diana, Midnight, Bismark, Venus, Aurora, Henrietta Fraction. **Owner:** Mrs. A. Krug, Bluecreek, Wash. (1941). Krug Gold & Copper Mining Co. (1907-1920). **Ore:** Copper, silver, gold. **Ore min:** Pyrite, chalcopryrite, tetrahedrite, galena, sphalerite, malachite, azurite, limonite, cuprite. **Deposit:** Several quartz veins in limestone and diabase. One vein 2 or 3 ft. wide is fairly well mineralized. Also some pyrite and chalcopryrite disseminated in diabase and metamorphics. **Dev:** 340-ft. adit, 35-ft. shaft, open cuts. **Assays:** A specimen from the 2- or 3-ft. vein assayed 0.49 oz. Au, 94.2 oz. Ag, 4.8% Cu. **Prod:** Small amount 1916. **Ref:** 7, pp. 109-110. 30, p. 43. 97, 1907, p. 476; 1916, p. 614. 116, no. 4, 1908, p. 90; no. 6, 1908, p. 124. 164, pp. 167-169.

**Lake**

(see under gold)

**Lakeside (7)**

**Loc:** Sec. 20, (40-37E), on W. side of Box Canyon, Orient dist. **Elev:** 2,830 ft. **Access:** Road above the property. **Prop:** 1 unpatented claim. **Owner:** Abandoned (1941). **Ore:** Copper, gold. **Ore min:** Chalcopryrite, pyrite, malachite. **Gangue:** Quartz. **Deposit:** Shear zone in Rossland volcanics is mineralized to a width of 1 ft. **Dev:** 125-ft. adit, 30-ft. drift, several open cuts. **Ref:** 30, p. 129. 164, p. 284.

**Lem (33)**

(see under gold)

**Liberty Copper (183)**

**Loc:** N½NE¼ sec. 2, (32-39E), Chewelah dist. **Elev:** 2,500 ft. **Access:** 2½ mi. SW. of Bluecreek by road. **Prop:** 6 unpatented claims. **Owner:** Liberty Copper Co. (1941). Liberty Copper Mining Co. (1907-1924). Copper Production Co. (1924-1926). **Ore:** Copper, gold, silver. **Ore min:** Pyrite, chalcopryrite, tetrahedrite, bornite, chalcocite, cuprite, malachite, azurite. **Gangue:** Quartz, siderite. **Deposit:** Mostly small, barren to slightly mineralized quartz veins in metamorphics. One vein 6 ft. wide, another 4 ft. wide. **Dev:** More than 2,000 ft. of workings on lower level and a 300-ft. adit on upper level. **Assays:** In 1909 an av. of 28 assays was \$19.20 Au, Ag, Cu. **Prod:** Has produced. **Ref:** 7, p. 110. 30, p. 42. 98, 1918-1926. 112, p. 614. 114, no. 5, 1909, p. 58. 116, no. 6, 1907, p. 28; no. 7, 1907, p. 13; no. 12, 1907, p. 15; no. 4, 1908, p. 90. 164, pp. 163-165.

**Little Frank (206)**

(see under lead)

**Little Gem**

(see under silver)

**Little Giant (14)**

(see under lead)

**Longshot (118)**

(see under lead)

**Lookout**

**Loc:** Chewelah dist. **Owner:** Copper Hoard Mining Co. (1918-1924). **Ore:** Copper. **Ref:** 98, 1918-1925.



**Loon Lake Blue Bird (172)**

**Loc:** SE¼NE¼ sec. 33, (31-41E), ¼ mi. E. of Loon Lake Copper workings on Grouse Cr. **Elev:** 2,550 ft. **Access:** 5½ mi. N. of the town of Loon Lake. **Prop:** 4 claims: Bluebird, Wonder, Dupont, Juno. **Owner:** John P. Orchgar, Loon Lake, Wash. (1941). Loon Lake Blue Bird Copper Co. (1918-1924). **Ore:** Copper. **Ore min:** Chalcopryrite, bornite, chalcocite, cuprite, malachite, azurite, pyrite. **Deposit:** 5- to 10-ft. quartz vein in argillite and quartzite. Vein sparsely mineralized. **Dev:** Shafts 40 and 82 ft. deep, adit 215 ft. long. Workings now caved. **Assays:** Vein in adit said to assay 3.87% Cu. **Prod:** Has produced. **Ref:** 58, p. 40. 98, 1920-1926. 106, no. 12, 1919, p. 5. 112, p. 189. 129, pp. 158-159. 164, p. 217.

**Loon Lake Copper (Kemp-Komar, Key West, Bluebird) (173)**

**Loc:** Near center sec. 33, (31-41E). **Elev:** 2,625 ft. **Access:** 6 mi. N. of the town of Loon Lake. **Prop:** 2 claims. **Owner:** Ernest Laukka and E. L. Tilton, Chewelah, Wash. (1954—). Kemp-Komar Copper Mining Co. (1902-1922). Loon Lake Copper Co. (1918-1929). James Keeth and W. H. West, Spokane, Wash. (1945). **Ore:** Copper, silver, gold. **Ore min:** Chalcopryrite, bornite, tetrahedrite, malachite, azurite, cuprite, atacamite, hematite, pyrite. **Deposit:** Quartz vein from 4 to 20 ft. wide in argillite. Known payshoot was 200 ft. long and 500 ft. deep. **Dev:** 480-ft. shaft from which about 700 ft. of drifts have been driven on 3 levels, 60-ft. shaft, and some drifts. Workings now inaccessible. **Assays:** Mill feed av. 2% Cu, a few oz. Ag, and a little Au. Highest Au value was \$2.00. **Prod:** About \$125,000 by 1918. **Ref:** 30, p. 30. 33, 1907, p. 714. 52, p. 10. 88, p. 8. 97, 1916-1919, 1929. 98, 1918-1925. 106, no. 20, 1918, p. 4; no. 14, 1919, p. 5; no. 22, 1920, p. 4. 112, pp. 153-155. 117, no. 2, 1916, pp. 10-11; no. 7, 1916, p. 4; no. 15, 1916, pp. 6-7; no. 9, 1917, pp. 4-5. 129, pp. 153-158. 130, p. 63. 164, pp. 217-219.

**Lottie (79)**

**Loc:** Sec. 19, (39-38E), Orient dist. **Elev:** 3,900 ft. **Prop:** 1 claim. **Ore:** Copper, gold, silver. **Ore min:** Pyrite, pyrrhotite, chalcopryrite. **Deposit:** 8-ft. mineralized zone in rhyolite porphyry intrusive into quartzite and andesite. **Dev:** 50-ft. shaft and trenches and open cuts for 500 ft. along course of the vein. **Assays:** 50 tons mined said to av. \$18 Au, Cu, Ag. **Prod:** About \$900 prior to 1914. **Ref:** 164, pp. 252-253.

**Lucky Boy (109)**

(see under lead)

**Lucky Boy (Turk)**

(see Turk)

**Lucky Charlie (8)**

**Loc:** NE¼ sec. 26, (40-36E), Orient dist. **Elev:** 2,240 ft. **Access:** Road. **Prop:** 1 claim, now part of the Hudspeth farm land. **Ore:** Copper, lead, zinc, silver. **Ore min:** Galena, sphalerite, chalcopryrite. **Deposit:** 2- to 6-in. vein of quartz in quartzite and schist contains small quantities of ore minerals. **Dev:** 300-ft. adit, 40-ft. shaft connecting with the adit, and a 30-ft. winze. **Ref:** 30, p. 119. 164, pp. 291-292.

**Lucky Four (65)**

(see under silver)

**M. and C.**

(see U. S. Copper Gold under silver)

**McKinley (4)**

(see under gold)

**McNally (29)**

(see also Pelkey and Dille, Regina)

**Loc:** Secs. 33 and 34, (40-37E), Orient dist. **Elev:** 2,600 to 2,800 ft. **Access:** Approx. 6 mi. E. of Rockcut by road. **Prop:** Several claims, including the Pelkey and Dille property. **Owner:** Bunker Hill & Sullivan Mining & Concentrating Co., San Francisco, Calif. (1937-1951). **Ore:** Copper, gold, silver, lead. **Ore min:** Pyrite, chalcopryrite, hematite. **Gangue:** Quartz, epidote, serpentine. **Deposit:** Replacement of limestone, also an 8-ft. quartz vein. **Dev:** 330-ft adit, 250-ft. adit, several short adits, 75-ft. shaft, and several open cuts total about 1,000 ft. **Prod:** 1938. **Ref:** 7, pp. 84-85. 30, pp. 124-125. 97, 1939, p. 491. 104, 4/15/37, p. 35. 113, 4/1/37, p. 7. 164, pp. 276-277.

**McNess (36)**

(see under gold)

**Mackinaw**

**Loc:** 2 mi. E. of Pierre Lk., Orient dist. **Owner:** Colville Gold Mining Co. (1897). **Ore:** Copper. **Ore min:** Chalcopryrite. **Ref:** 63, p. 107.

**Magma (113)**

(see under zinc)

**Majorca (80)**

**Loc:** Sec. 19, (39-38E), 200 ft. W. of the Minorca claim, Orient dist. **Prop:** 1 claim. **Ore:** Copper. **Ore min:** Pyrite, malachite. **Deposit:** Limestone cut by basic igneous dikes. Mineralized zone contains a little pyrite and copper stains. **Dev:** 40-ft. inclined shaft. **Ref:** 164, p. 254.

**Maple Leaf**

(see Melrose under silver)

**Maryland**

(see Bonanza Copper)

**Mayflower (170)**

(see under lead)

**Melrose (51)**

(see under silver)

**Mexico**

(see Queen under silver)

**Middleport (117)**

(see under zinc)

**Mineral Hill**

(see Aichan Bee under silver)

**Minnehaha (151)**

**Loc:** Sec. 36, (33-40E), on E. Fk. Chewelah Cr., Chewelah dist. **Owner:** D. F. Strobeck, Spokane, Wash. (1902). **Ore:** Copper, gold, silver. **Deposit:** Mineralized zone 8 to 30 ft. wide. **Dev:** 40-ft. adit. **Assays:** Av. assay value is 6% Cu, \$7.50 Au, 6.5 oz. Ag. **Ref:** 88, p. 7.

**Minorca (81)**

**Loc:** Sec. 19, (39-38E), on W. branch of Fifteen Mile Cr., Orient dist. **Elev:** 3,200 ft. **Owner:** Centennial Mines Co. (1924). Minorca-Homestake Mines Co. (1922). **Ore:** Copper, gold, silver. **Ore min:** Pyrite, pyrrhotite, chalcopryrite. **Gangue:** Quartz. **Deposit:** Vein in limestone and argillite, which are cut by altered basic dikes. **Dev:** 2 shafts, one of which is 165 ft. deep. **Prod:** 100 tons prior to 1920. **Ref:** 98, 1922, p. 1656; 1925, p. 1808. 100, 1903, p. 55. 164, p. 250.

**Mint**

**Loc:** On Gold Hill near present town of Kettle Falls. **Prop:** Group of claims. **Owner:** D. F. Strobeck, Spokane, Wash. (1902). **Ore:** Copper, gold, silver. **Deposit:** 3 veins varying in width

from 8 to 25 ft. **Dev:** Adit and shaft aggregating 200 ft. **Assays:** 8% Cu, 5 oz. Ag, \$8 Au. **Ref:** 88, p. 6.

### Mogul (13)

**Loc:** Sec. 25, (40-36E), Orient dist. **Elev:** 3,600 ft. **Access:** Near road. **Prop:** 8 unpatented claims. **Owner:** Abandoned (1941). **Ore:** Copper, gold. **Ore min:** Chalcopyrite, bornite. **Deposit:** Schist and quartzite cut by a diorite dike. Near contact of the dike with the other rocks are mineralized quartz veins. **Dev:** Several adits and shafts total about 200 ft. **Ref:** 30, p. 129. 164, p. 287.

### Molly Gibson (40)

(see under gold)

### Monahan (201)

**Loc:** Sec. 28, (30-38E). Cedar Canyon dist. **Access:** Road. **Prop:** 1 claim and 30 acres of deeded land. **Owner:** C. F. Allen, Springdale, Wash. (1941). **Ore:** Said to be copper, silver, gold. **Deposit:** Said to be a quartz vein about 12 ft. wide. **Dev:** About 1,400 ft. of workings, mostly adits. **Assays:** Said to assay \$8 Cu, Ag, Au. **Ref:** 30, p. 76.

### Monitor (27)

(see under gold)

### Montana (76)

(see under gold)

### Montana and Washington (15)

**Loc:** Sec. 30, (40-37E), Orient dist. **Elev:** 2,500 to 2,750 ft. **Access:** 4 mi. from Rockcut by road. **Prop:** 4 claims: Bisbee, Green Frog, Minneapolis, St. Paul. **Owner:** Mr. Maynard and sons, Orient, Wash. (1941). **Ore:** Copper, gold, silver. **Ore min:** Chalcopyrite, bornite, galena, pyrite. **Deposit:** 5 quartz veins in gneissoid granite. Veins from 6 in. to 25 ft. wide. **Dev:** 215-ft. adit and numerous open cuts, short adits, and shafts totaling more than 300 ft. **Assays:** Ore from St. Paul assayed from \$5.90 to \$95.60 per ton. Ore from Green Frog assayed \$5.20 Au. Cu chief value on Minneapolis, but 16 to 20 oz. Ag sometimes present. **Ref:** 30, p. 127. 106, 7/21/32, p. 1. 158. 164, p. 279-280.

### Montezuma (181)

**Loc:** SW¼ sec. 13, (32-39E). **Access:** 7 mi. due W. of Chewelah by road. **Prop:** 40 acres of deeded land. **Owner:** John Rietzkers, Bluecreek, Wash. (1941). **Ore:** Copper reported. **Deposit:** Barren 4-in. quartz vein in quartzite and argillite. No ore exposed. **Dev:** 150-ft. adit from which a 110-ft. drift has been driven. **Ref:** 30, p. 43. 164, p. 169.

### Montgomery (168)

**Loc:** Secs. 17 and 20, (32-41E), Chewelah dist. **Elev:** 2,840 ft. **Prop:** 160 acres of leased State land. **Owner:** Leased by Elmer Mullen, Chewelah, Wash. (1948). **Ore:** Copper, lead, silver, gold. **Ore min:** Chalcopyrite, galena, hematite. **Gangue:** Quartz, siderite. **Deposit:** 3-ft. vein in quartzite and schist carries ore minerals. 2 other veins or continuations of the 3-ft. vein have been exposed, one of which carries some galena and chalcopyrite. **Dev:** 400-ft. adit, 150-ft. adit, 140-ft. shaft, 2 shorter adits, and a 15-ft. shaft. **Ref:** 30, p. 35. 52, p. 12. 164, p. 158.

### Montgomery (Platsburg)

(see Platsburg)

### Moonlite

(see Morning under silver)

### Moore (48)

(see under gold)

### Moraski (52)

**Loc:** Sec. 1, (40-40E), 1 mi. W. of Columbia R., Northport dist. **Access:** Near road. **Prop:** 1 unpatented claim. **Owner:** Abandoned (1941). **Ore:** Copper, gold. **Ore min:** A little chalcopyrite and pyrite. **Gangue:** Quartz. **Deposit:** Argillite, quartzite, schist, and limestone cut by basic and acidic dikes. A much-altered aplite dike is slightly mineralized. **Dev:** 15-ft. adit, several small open cuts. **Ref:** 30, p. 96. 164, p. 317.

### Morning (114)

(see under silver)

### Morning Star

(see under gold)

### Mountain View (47)

(see under silver)

### Mullen (165)

(see under lead)

### Myeerah (60)

(see under lead)

### Mystery (28)

**Loc:** SE¼ sec. 29, (40-37E), in lower part of Box Canyon, Orient dist. **Elev:** 2,680 ft. **Access:** About 4 mi. E. of Rockcut by road. **Prop:** Several unpatented claims. **Owner:** Abandoned (1941). **Ore:** Copper, gold. **Ore min:** Pyrite, chalcopyrite. **Deposit:** Altered latite flows cut by granite dikes. An 8-ft. quartz vein in these rocks is somewhat mineralized. Fracture zones also mineralized to some extent. **Dev:** 300-ft. adit, 40-ft. adit, 25-ft. shaft, several other adits, shallow shafts, and open cuts. **Ref:** 30, p. 128. 164, p. 283.

### Nabob (155)

**Loc:** Sec. 9, (32-41E), Chewelah dist. **Access:** Road passes near the property. **Prop:** 1 claim. **Owner:** O. C. Niles, Chewelah, Wash. (1941). **Ore:** Copper, gold. **Ore min:** Pyrite, pyrrhotite, small amount of chalcopyrite. **Deposit:** A 1-ft. quartz vein in quartzite. **Dev:** Shallow inclined shaft. **Assays:** Said to carry small values in gold. **Ref:** 30, p. 40. 164, p. 159.

### Napoleon (100)

(see under iron)

### Nellie S.

(see Chewelah Standard)

### Nest Egg (90)

(see under gold)

### Nevada (180)

(see under lead)

### Newport (Eagle-Newport)

(see Aguila under lead)

### Noble Four

**Loc:** Bossburg dist. **Ore:** Copper, silver, lead, gold. **Ref:** 105, 1911, p. 511.

### Old Abe

**Loc:** Summit dist., near Columbia R. **Owner:** J. N. Squire (1892). **Ore:** Copper, silver. **Deposit:** 4-ft. quartz vein. **Dev:** 40-ft. shaft. **Assays:** 5% Cu, 20 oz. Ag. **Ref:** 12, p. 79. 13, p. 124.

### O-Lo-Lim (214)

**Loc:** NW¼SE¼ sec. 9, (28-37E), 3 mi. N. of Spokane R., Cedar Canyon dist. **Access:** 1½ mi. NE. of Detillion Bridge. **Prop:** 2 claims on 40-acre Indian Agency lease. **Owner:** West King Mining Co. (1941). O-Lo-Lim Copper Mining Co. (1918-1926). **Ore:** Copper, silver, zinc, gold. **Ore min:** Chalcopyrite, pyrite, bornite, malachite, tenorite. **Gangue:** Quartz, tremolite. **Deposit:** 2- to 6-ft. quartz vein near plane of contact between

argillite and quartzite. Intrusive granite within  $\frac{1}{4}$  mi. **Dev:** 100-ft. shaft with 35- and 15-ft. drifts at bottom, vertical shaft 220 ft. deep. **Assays:** 10 cars of ore shipped av. 7% to 10% Cu, 1 to 2 oz. Ag. **Prod:** About \$18,000 to end of 1920. **Ref:** 30, pp. 69-70. 46, pp. 110-111. 97, 1917-1919. 98, 1920-1926. 112, p. 196. 129, p. 160-162. 164, p. 223.

### O'Neal-Schenk

(see Rightside)

### Ora

**Loc:** On or near Jumbo Mtn. W. of Fifteen Mile Cr., Northport dist. **Elev:** 3,400 ft. **Prop:** 1 claim. **Ore:** Copper, gold, silver. **Ore min:** Pyrrhotite, chalcopryrite. **Deposit:** 7-ft. vein in altered diorite dike rock intrusive into Jumbo volcanics. **Dev:** Shallow shafts, open cuts, and a large amount of surface stripping along the vein. **Assays:** Said to assay \$11 in Au, Cu, Ag. **Prod:** 50 tons of ore shipped prior to 1914. **Ref:** 164, pp. 253-254.

### Orchid (195)

(see under silver)

### Orient, Crescent, and Deadwood (96)

**Loc:** Sec. 31, (39-37E) and sec. 36, (39-36E), on W. slope of Toulou Mtn., Orient dist. **Elev:** 1,800 to 2,050 ft. **Access:**  $2\frac{1}{2}$  mi. by road from railroad at Orient. **Prop:** 3 patented claims: Orient, Deadwood, Crescent. **Owner:** Stevens County (1941). **Ore:** Copper, gold. **Ore min:** Chalcopryrite, pyrite. **Deposit:** Mineralized fracture zones 4 ft. wide in calcareous argillite. **Dev:** 250 ft. of shafts, open cuts, long adit (caved 1941). **Assays:** \$9.00 per ton (1920). **Ref:** 7, pp. 79-80. 30, p. 132. 164, pp. 268-269.

### Orient Eureka

(see Eureka under gold)

### Orpha (82)

**Loc:** Sec. 19, (39-38E), 5 mi. NW. of Williams on the Columbia R., Northport dist. **Elev:** 3,750 to 3,950 ft. **Prop:** 3 claims: Orpha Nos. 1, 2, and 3. **Ore:** Copper, gold. **Ore min:** Pyrite, pyrrhotite, chalcopryrite. **Deposit:** Several veins exposed. One is 12 ft. wide. Country rock is basic andesite cut by rhyolite porphyry dikes. **Dev:** 3 shafts, 150, 20, and 15 ft. deep; 55-ft. adit; and large open cut. **Assays:** Reported to carry Au. **Ref:** 164, p. 252.

### Pacific Copper (182)

**Loc:** SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 13, (32-39E), Chewelah dist. **Elev:** 2,700 to 2,900 ft. **Access:** 4 mi. by road S. of Bluecreek. **Prop:** 160 acres of deeded land. **Owner:** Northwest Magnesite Co. (1941). **Ore:** Copper, gold. **Ore min:** Chalcopryrite. **Gangue:** Quartz, calcite. **Deposit:** Small quartz seams in greenstone and quartzite contain some chalcopryrite. One seam 3 in. wide, another 10 to 14 in. wide. **Dev:** 460-ft. adit, 125-ft. shaft, 40-ft. shaft, open cut. **Ref:** 30, p. 42. 164, pp. 166-167.

### Paragon

(see Melrose under silver)

### Paymaster

**Loc:** Orient dist. **Owner:** Paymaster Mining Corp. (1909). **Ore:** Copper, gold. **Ref:** 114, no. 5, 1909, p. 62.

### Payne (162)

**Loc:** Sec. 8, (32-41E), Chewelah dist. **Access:** Road. **Prop:** 1 claim. **Owner:** J. H. Savage, Chewelah, Wash. (1941). **Ore:** Copper, silver, gold, zinc. **Deposit:** Quartz vein in granite. **Dev:** Vertical shaft, 75-ft. inclined shaft, and 50-ft. adit. **Ref:** 30, p. 33.

### Pedro (77)

(see under gold)

### Pelkey and Dille (30)

(see also McNally)

**Loc:** Secs. 28, 33, and 34, (40-37E), on N. side of Pierre Cr. E. of Box Canyon. **Access:** 6 mi. E. of Rockcut by road. **Prop:** 2 claims, now part of McNally group. **Ore:** Copper, gold. **Ore min:** Pyrite, chalcopryrite. **Deposit:** Limestone, quartzite, and argillite cut by igneous dikes. Ore occurs in fracture zones in these rocks. **Ref:** 30, p. 127. 164, p. 280.

### Perry (138)

**Loc:** NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 7, (33-41E), on hill of 2,890-ft. elevation. **Elev:** 2,800 ft. **Prop:** 2 unpatented claims. **Owner:** Harold F. Newell, Colville, Wash. (1955—). **Ore:** Copper. **Ore min:** Chalcopryrite, pyrite, malachite. **Gangue:** Argillite. **Deposit:** Thin-bedded argillites with sparsely disseminated ore minerals along the bedding planes. A 22-in. vein of nearly solid chalcopryrite reported in the shaft. **Dev:** Shaft 90 ft. deep and numerous shallow shafts and open cuts. **Ref:** 158.

### Platsburg (Montgomery) (184)

**Loc:** Sec. 35, (33-39E) and sec. 2, (32-39E), Chewelah dist. **Access:** Road. **Prop:** 4 claims. **Owner:** James Platt, Chewelah, Wash. (1941). **Ore:** Copper, gold. **Deposit:** Said to be a quartz "dike" 50 ft. wide, which is sparsely mineralized with copper and gold. **Dev:** 100-ft. shaft and 600 ft. of crosscut tunnels. **Ref:** 30, p. 33.

### Pomeroy (34)

(see under zinc)

### Pop (Silent Bell) (85)

**Loc:** Sec. 27, (39-37E), Orient dist. **Elev:** 4,000 ft. **Access:** 3 mi. from road. **Prop:** 2 patented claims: Lucky Page, Populist. **Owner:** H. C. Topping and V. E. Blair, Orient, Wash. (1941). **Ore:** Copper, gold, silver. **Ore min:** Pyrite, chalcopryrite, pyrrhotite, limonite. **Gangue:** Quartz. **Deposit:** Argillite, limestone, and schist cut by monzonite dikes. Ore minerals occur in honeycombed quartz in the limestone. One ore zone 2 ft. wide, another 10 ft. wide. **Dev:** Shaft, short adit, and open cut on Lucky Page claim. 140-ft. adit, 50-ft. adit, and 80-ft. shaft on Populist claim. **Assays:** Ore on Lucky Page claim reported to assay as high as \$41 Au, Cu, Ag. **Ref:** 30, p. 131. 164, p. 272.

### Providence (46)

(see under lead)

### Providence

(see Deer Trail under silver)

### Quadra

(see under gold)

### Quartzite Mountain (169)

**Loc:** W $\frac{1}{2}$ NE $\frac{1}{4}$  sec. 17, (32-41E), about 50 ft. above the W. shore of a small lake. **Elev:** 2,500 ft. **Access:** Road within  $\frac{1}{2}$  mi. of the property. **Ore:** Copper. **Ore min:** Chalcopryrite, bornite, cuprite, malachite. **Gangue:** Calcite. **Deposit:** Calcareous argillite contains a few scattered ore minerals. **Dev:** Adit about 400 ft. long. **Ref:** 158.

### Queen (210)

(see under silver)

### Queen and Seal

(see Queen under silver)

### Rambler (197)

**Loc:** NE $\frac{1}{4}$  sec. 15, (30-38E), on E. slope of Huckleberry Mtn., Deer Trail dist. **Elev:** 3,200 ft. **Access:** Near road. **Prop:** 3 claims: Morning Star, Evening Star, Rambler No. 2. **Owner:** John Wolf and associates (1920). Believed to be abandoned (1941). **Ore:** Copper. **Ore min:** Chalcopryrite. **Deposit:** Several quartz veins, one 4 ft. wide. Some ore minerals in limestone

also. Zone in which workings are located is near the surface and badly broken. No sizable or continuous ore body exposed. **Dev:** 265-ft. adit, several other short adits. **Prod:** 1916, 1917. **Ref:** 30, p. 63. 97, 1916, p. 616; 1917, p. 507. 164, pp. 210-211.

#### Read (199)

(see under iron)

#### Reardon Copper

(see Turk)

#### Red Cloud (Giant Silver) (204)

**Loc:** Sec. 6, (29-38E), 2 mi. SE. of Turk, Cedar Canyon dist. **Elev:** 3,400 ft. **Access:** ½ mi. off the Deer Trail road. **Prop:** Group of claims. **Owner:** Mrs. Holland, Davenport, Wash. (1941). Giant Silver Mining Co. (1921-1926). **Ore:** Copper, silver, lead, gold. **Ore min:** Chalcopryrite, pyrite, silver sulfide (?), limonite, malachite. **Gangue:** Quartz, calcite, siderite. **Deposit:** Irregular fractures in quartzite, near intrusive granite, are filled with a quartz, calcite, and siderite gangue carrying considerable chalcopryrite and pyrite. Low-grade deposit. **Dev:** Caved shaft, 100-ft. crosscut, 200-ft. crosscut, and 160-ft. crosscut. **Prod:** Unknown amount of silver ore. **Ref:** 30, p. 75. 97, 1928, p. 703. 98, 1922-1926. 129, pp. 150-151.

#### Red Lion (21)

**Loc:** Sec. 1, (39-36E), on E. side of road from Orient to Rockcut. **Access:** Near road. **Prop:** 160 acres of deeded land and several unpatented claims. **Owner:** Clarence Houtchin, Orient, Wash. (1941). **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, pyrite. **Gangue:** Quartz. **Deposit:** Diorite in which are zones of fracturing and crushing. Zones are decomposed and slightly mineralized. **Dev:** 6 adits, one 275 ft. long. **Ref:** 30, p. 131. 164, pp. 292-293.

#### Red Sheaf (104)

(see under gold)

#### Red Top (57)

(see under lead)

#### Redemption

**Loc:** Valley area. **Ore:** Copper. **Prod:** 1918. **Ref:** 97, 1918, p. 511.

#### Redwood

(see Eagle under silver)

#### Regina (31)

(see also McNally)

**Loc:** Secs. 33 and 34, (40-37E), on S. side of Pierre Cr., Orient dist. **Elev:** 2,820 ft. **Access:** Near road, 6 mi. from railroad at Rockcut. **Prop:** 1 unpatented claim, now part of McNally group (1941). **Owner:** Fitzgerald estate (1941). Hester Mining Co. (1909). **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, pyrite. **Gangue:** Quartz. **Deposit:** Limestone, quartzite, and latite cut by granite dikes. Mineralization occurs in the country rock at its contact with granite. One mineralized zone is 2½ ft. wide. **Dev:** 300 ft. of work in shafts and adits. **Assays:** Ore said to yield \$20 Cu, Au. **Ref:** 30, p. 126. 114, no. 5, 1909, p. 60. 164, pp. 275-276.

#### Revenue

**Loc:** Stevens County. **Owner:** Revenue Mining Co. (1907). **Ore:** Copper, gold. **Ref:** 33, 1907, p. 965.

#### Rightside (Coyote, Gray Eagle, Koyotte, O'Neal-Schenk) (123)

**Loc:** Center sec. 17, (or NE¼ sec. 18) (?), (36-38E), on E. side of Roosevelt Lk., Kettle Falls dist. **Access:** About 1 mi. N. of Kettle Falls by road. **Prop:** 2 claims: Rightside, Rightside No. 2. **Owner:** E. B. Gibbs, Colville, Wash., leasing from Cham-

berlain and Miller (1953—). James O'Neal and George Schenk, Kettle Falls, Wash. (1942). **Ore:** Copper, silver, gold, lead, molybdenum. **Ore min:** Bornite, chalcopryrite, pyrite, a little molybdenite, cuprite, malachite, azurite, galena. **Gangue:** Quartz, calcite, gypsum. **Deposit:** An 8-ft. mineralized fracture zone in a series consisting of argillite and quartzite cut by granite dikes. One vein is 4 ft. wide. **Dev:** Adit connected to surface by an 80-ft. raise, 20-ft. shaft. Workings total about 1,400 ft. **Assays:** One assay showed \$18.50 Cu, \$2.50 Ag. Zone is reported to av. 12% Cu, 22 oz. Ag. **Prod:** Small amount of copper ore in 1918. About 50 tons of copper conc. per week in 1954. **Ref:** 30, pp. 55-56. 97, 1914, p. 653. 158. 164, p. 231.

#### Rinchaw

(see Middleport under zinc)

#### Robena

(see Young America under zinc)

#### Rocky Creek

(see Burrus under zinc)

#### Rocky Lake (133)

(see under molybdenum)

#### Royal (140)

**Loc:** W½ sec. 28, (33-41E), on W. slope near summit of Eagle Mtn., Chewelah dist. **Access:** 1 mi. from road. **Prop:** 6 unpatented claims. **Owner:** United Copper Co. (1941). **Ore:** Copper. **Deposit:** Quartz and siderite, containing values in copper, have been found as float. An adit driven in banded quartzite failed to encounter source of the float. **Dev:** 460-ft. crosscut adit. **Ref:** 30, p. 41. 164, p. 160.

#### Royal Gold

(see Hubbard under lead)

#### St. Crispin (49)

(see under gold)

#### St. Paul-Express

**Loc:** On Gold Hill near the Mint group, Meyers Falls dist. **Prop:** 2 claims. **Owner:** D. F. Strobeck, Spokane, Wash. (1902). **Ore:** Copper, gold, silver. **Deposit:** 2 veins from 12 to 35 ft. wide. **Dev:** Adit and shaft. **Assays:** 9% Cu, \$7.50 Au, 5 oz. Ag. **Ref:** 88, p. 6.

#### Salina (18)

**Loc:** Near SW. cor. sec. 36, (40-36E), Orient dist. **Access:** About 1,000 ft. NE. of Rockcut. **Prop:** Several unpatented claims. **Owner:** Abandoned (1941). **Ore:** Copper. **Ore min:** Chalcopryrite. **Deposit:** Chalcopryrite stringers in a zone of crushed country rock 18 in. wide. Country rock consists of gneiss cut by dikes and masses of basic diorite. **Dev:** 2 adits, one 78 ft. long. **Ref:** 30, p. 130. 164, p. 290.

#### Saratoga

(see under gold)

#### Saturday Night-Sunday Morning (211)

(see under lead)

#### Schenk

(see Rightside)

#### Schoneberg

(see Schrenberg under antimony)

#### Schrenberg (163)

(see under antimony)

#### Scotia (99)

**Loc:** Near NW. cor. sec. 5, (38-37E), Orient dist. **Elev:** 2,600 to 2,825 ft. **Access:** Connected to Globe prospect by ½ mi. of trail. **Prop:** 3 patented and other unpatented claims.

**Owner:** Stevens County (1941). **Ore:** Copper, gold, iron. **Ore min:** Pyrrhotite, pyrite, chalcopyrite. **Deposit:** Ore minerals occur as seams and pods along joint planes in schist and quartzite. No well-defined veins. Deposits are small and siliceous. **Dev:** 150-ft. adit, 200-ft. shaft, large open cut, shallow shaft. **Assays:** Ore said to av. 40% pyrrhotite. **Prod:** Some shipments are said to have been made to a smelter as flux. **Ref:** 7, pp. 78-79. 30, p. 132. 114, no. 5, 1909, p. 61. 164, pp. 266-267.

### Security Copper (158)

**Loc:** Secs. 6 and 7, (32-41E),  $\frac{1}{4}$  mi. N. of Juno Echo mine. **Elev:** 2,220 ft. **Access:** 3 mi. E. of Chewelah by road. **Prop:** 3 unpatented claims. **Owner:** Homer Shepler, Chewelah, Wash. (1941). Security Copper Co. (1915-1926). **Ore:** Copper, silver. **Ore min:** Chalcopyrite, pyrite, malachite. **Deposit:** Ore minerals occur in decomposed argillite containing stringers of quartz. There are 6 veins. In some instances ore minerals occur in the quartz and in others in argillite. **Dev:** 552-ft. shaft with 635 ft. of drifts and crosscuts. Other shallow shafts, open cuts, and trenches. **Ref:** 30, p. 39. 98, 1918-1926. 158. 164, pp. 154-156.

### Shallenberger

(see Copper Butte)

### Short Wait (67)

(see under lead)

### Sierra Zinc (112)

(see under zinc)

### Silent Bell

(see Pop)

### Silver Basin

(see Queen under silver)

### Silver Mountain

(see Daisy-Tempest under silver)

### Silver Queen (Queen)

(see Queen under silver)

### Silver Queen (Ark)

(see Ark under silver)

### Silver Seal

(see Queen under silver)

### Silver Summit (187)

(see under lead)

### Silver Trail (107)

(see under lead)

### Smoky Bullion

(see A and C)

### Snyder and Baxter

(see under silver)

### Sprague

(see Checops)

### Squire

(see under lead)

### Stemwinder (10)

**Loc:** W $\frac{1}{2}$  sec. 25, (40-36E), 1,000 ft. E. of Lucky Charlie property, Orient dist. **Access:** Near road. **Prop:** 1 unpatented claim. **Owner:** Abandoned (1941). **Ore:** Copper, lead, silver. **Ore min:** Galena, chalcopyrite, pyrite. **Deposit:** 2- to 4-in. vein of quartz in quartzite and schist. Very small amounts of ore minerals in the vein. **Dev:** 12-ft. shaft, open cuts. **Ref:** 30, p. 130. 164, p. 291.

### Stockwell

(see Columbia Tungsten under tungsten)

### Strobeck

(see Independent Keystone)

### W. B. Stuart

(see John Day under silver)

### Sugar Loaf

(see Vanasse under silver)

### Summit (6)

**Loc:** Sec. 20, (40-37E), high on mountain, or possibly NE $\frac{1}{4}$  sec. 5, (39-37E), Orient dist. **Access:** Near road but difficult of access. **Prop:** 2 unpatented claims. **Owner:** Abandoned (1941). Summit Gold & Copper Mining Co. (1908-1909). **Ore:** copper, gold. **Deposit:** Quartz vein. **Dev:** 300-ft. crosscut adit. **Ref:** 30, p. 126. 33, 1908, p. 1281. 114, no. 5, 1909, p. 62.

### Summit (Silver Summit)

(see Silver Summit under lead)

### Sunday Morning

(see Saturday Night-Sunday Morning under lead)

### Sunnyside

(see under gold)

### Sunset (50)

(see under lead)

### Superior Copper (178)

**Loc:** SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 20, (32-40E), in lower part of Buck Canyon, Chewelah dist. **Elev:** 2,245 ft. **Access:** Road. **Prop:** 40 acres of deeded land. **Owner:** Norman Finch, Chewelah, Wash. (1941). **Ore:** Copper, gold, silver, lead, tungsten. **Ore min:** Chalcopyrite, malachite, azurite, pyrite. **Deposit:** 5-ft. quartz vein with 1 ft. of schist in its center lies parallel to the planes of schistosity in a series consisting of quartzite, argillite, and schist. **Dev:** 790-ft. crosscut adit and several open cuts. **Prod:** Several carloads of ore. **Ref:** 30, p. 45. 105, vol. 99, 1909, p. 379; vol. 105, 1912, p. 545. 164, pp. 188-189.

### Sure Thing (93)

(see under gold)

### Sweet Home

(see Big Jim under gold)

### Syndicate

**Loc:** Near Bald Eagle property, Orient dist. **Owner:** Syndicate Gold Mining Co. (1897). **Ore:** Copper, gold, silver. **Dev:** 15-ft. shaft. **Assays:** 19% Cu, \$13 Au, \$2.17 Ag (1897). **Ref:** 63, p. 107.

### Tempest (132)

(see under silver)

### Tenderfoot

(see Avondale-Dome under lead)

### Thomason Queen (136)

**Loc:** Near NE. cor. sec. 1, (33-40E), or SE. cor. sec. 36, (34-40E), Chewelah dist. **Elev:** 2,500 ft. **Access:** Road. **Prop:** 6 unpatented claims. **Owner:** R. C. Thomason, Chewelah, Wash. (1941). **Ore:** Copper, silver, gold. **Ore min:** Chalcopyrite, malachite, azurite, bornite (?), pyrite. **Gangue:** Quartz. **Deposit:** Brecciated quartzite contains sparsely disseminated ore minerals. **Dev:** 185-ft. adit, a shaft, and a caved adit, also numerous open cuts. **Ref:** 30, p. 38. 158.

### Togo (203)

**Loc:** SE $\frac{1}{4}$  sec. 31, (30-38E), on opposite side of canyon from Deer Trail group. **Elev:** 3,150 to 3,650 ft. **Access:** Road.

**Prop:** 9 unpatented claims. **Owner:** Alpine Uranium Corp., Salt Lake City, Utah (1954—). Consolidated Copper Co. (1915-1929). Togo Copper Co. (1929). Valentine Brasch, Fruitland, Wash., leasing to J. W. Lower and J. W. Geisbauer, Fruitland, Wash. (1951). **Ore:** Copper, silver, lead. **Ore min:** Chalcopryrite, pyrite, malachite, azurite, arsenopyrite. **Gangue:** Quartz, calcite, tremolite. **Deposit:** 2 quartz veins 4 to 18 in. wide cut calcareous argillite and dolomite. Ore disseminated in wall rocks as well as in the veins. **Dev:** 1,150-ft. adit, 200-ft. adit, shaft, open cuts. **Prod:** 1950. **Ref:** 30, p. 72. 73, p. 134. 97, 1929, p. 429. 98, 1918-1926. 106, 9/1/28; 12/5/29. 112, p. 206. 141, p. 22. 150, p. 40. 158. 164, pp. 201-203.

### Tramp

**Loc:** On or near Jumbo Mtn., Northport dist. **Elev:** 3,100 ft. **Prop:** 1 claim. **Ore:** Copper, gold. **Ore min:** Pyrite, pyrrhotite, chalcopryrite. **Gangue:** Quartz. **Deposit:** 5-ft. vein in altered rhyolite porphyry intrusive into Jumbo volcanics. Mineralization extends into the wall rock to a minor extent. **Dev:** 20-ft. adit with a 35-ft. drift, several small open cuts. **Ref:** 164, p. 254.

### Treadwell

(see Iron Mask under zinc)

### Trojan (91)

(see under gold)

### Turk (High Grade, Lucky Boy, Reardon Copper) (205)

**Loc:** N½ sec. 6, (29-38E), ¼ mi. SW. of the Togo mine, Cedar Canyon dist. **Elev:** 3,190 to 3,340 ft. **Access:** 1 mi. by road SE. of Turk. **Prop:** Deeded land. **Owner:** Alpine Uranium Corp., Salt Lake City, Utah (1954—). Turk Mining Co. (1905-1907). High Grade Mining Co. (1916-1920). Reardon Copper Co. (1920-1921). Snowdrift Mining Co. (1928-1929). Columbia River Copper Co. (1929-1937). C. F. Allen, Springdale, Wash., leasing to J. W. Lower and J. W. Geisbauer, (1950—). **Ore:** Copper, silver, gold. **Ore min:** Chalcopryrite, pyrite, tenorite, cuprite, native copper, malachite, marcasite, bornite. **Gangue:** Calcite, barite. **Deposit:** Ore occurs along shear zones in argillite and limestone, partly as fracture filling and partly as replacement of the rock. Lenses mined av. 6 ft. thick and 125 ft. wide. An 18-ft. vein reported. **Dev:** 4,000 ft. on 3 levels, including connecting stopes and raises. Strip pit (1955). **Improv:** 125-ton mill (1955). **Assays:** Typical assay said to be 9% Cu, 2 oz. Ag, 0.1 oz. Au. **Prod:** Considerable production prior to 1919. 1939-1942. 600 tons per month in 1941, 68 tons of copper conc. in 1942. 1950. 1954 (100 tons of conc.) **Ref:** 30, pp. 70-72. 33, 1907, p. 1102. 97, 1905, 1916-1919, 1928, 1929. 98, 1918-1926. 106, 9/1/28; 2/18/32. 112, p. 173. 113, 7/1/37, p. 16. 129, pp. 146-149. 130, p. 63. 141, p. 22. 150, p. 40. 158. 164, pp. 203-204.

### Twilight (24)

**Loc:** Sec. 4, (38-37E), Orient dist. **Access:** Just off the Orient-Bossburg road. **Prop:** Several unpatented claims. **Owner:** Abandoned (1941). **Ore:** Copper, gold. **Ore min:** Pyrite, chalcopryrite, azurite, malachite, limonite. **Deposit:** Argillite and limestone cut by a granite dike. A fracture zone has been slightly mineralized to a width of 6 ft. **Dev:** 475-ft. adit. **Assays:** Said to assay from \$6 to \$100 per ton. **Ref:** 30, p. 132. 164, pp. 272-273.

### Twin Cabins

(see Hope and Twin Cabins)

### U. S. Copper Gold (164)

(see under silver)

### Udehard (2)

(see under gold)

### Uncle Sam (86)

**Loc:** Sec. 27, (39-37E), on SW. slope of Jumbo Mtn., Orient dist. **Prop:** 2 unpatented claims, including Quartette. **Owner:** Abandoned (1941). **Ore:** Copper, lead, gold, silver. **Ore min:** Pyrite, chalcopryrite, and a little galena. **Gangue:** Quartz, siderite. **Deposit:** Breccia in a fracture zone in argillite and calcareous argillite has been slightly mineralized. **Dev:** 80-ft. shaft, 12-ft. shaft, and some open cuts. **Ref:** 30, p. 134. 164, p. 274.

### United Copper (United Silver Copper) (148)

**Loc:** E½NW¼ sec. 32 and NE¼ sec. 31, (33-41E), on W. slope of Eagle Mtn. **Elev:** 2,400 to 3,375 ft. **Access:** 5 mi. NE. of Chewelah by good truck road. **Prop:** 7 claims, 5 fractions. **Owner:** Chewelah Copper Co., Colville, Wash. (1951—). United Copper Mining Co. (1907-1920). United Silver Copper Mining Co. (1919-1924). United Mines Corp. (1926). Chewelah Union Mining Co. (1930). United Copper Mines, Inc. (1943-1951). **Ore:** Copper, silver, gold. **Ore min:** Chalcopryrite, tetrahedrite (freibergite), pyrite, arsenopyrite, malachite. **Gangue:** Quartz, calcite, siderite. **Deposit:** Mineralized zone in fractured argillite 5 to 20 ft. wide (av. 8 ft.). Tetrahedrite forms a persistent streak 2 to 12 in. wide. **Dev:** Adit 4,200 ft. long, 500-ft. adit, 300-ft. shaft, considerable drifting and stoping. **Improv:** 200-ton flotation mill at Palmers (1955). **Assays:** High-grade carries 75 to 300 oz. Ag. Mill feed av. 1.5% Cu, 3.5 oz. Ag, 0.01 to 0.02 oz. Au. **Prod:** 1907-1925, 1928-1931. \$2½ million up to 1934. 1943. This and Amazon claim produced 2,000 tons of ore in 1954. **Ref:** 7, pp. 98-102. 30, p. 33. 97, 1907-1925, 1928-1931. 98, 1918-1926. 105, vol. 124, 1922, pp. 126, 204. 106, no. 1, 1919, p. 3; no. 2, 1919, pp. 4-5; no. 9, 1919, p. 4; no. 4, 1920, p. 5. 112, p. 207. 114, no. 5, 1909, p. 58. 117, no. 1, 1922, p. 28. 129, pp. 123-131. 130, pp. 63, 87. 133, p. 40. 141, pp. 20, 22, 37. 158. 164, pp. 139-141.

### United Silver Copper

(see United Copper)

### United Treasure (59)

(see under silver)

### Valley (174)

**Loc:** W½NW¼SW¼ sec. 18, (31-41E), on top of small isolated knob, near Valley. **Access:** A few hundred yards from road. **Ore:** Copper. **Ore min:** Malachite. **Deposit:** Quartz vein at contact of argillite and granite is copper stained in "honey-comb" phase of the vein. **Dev:** Open cut. **Ref:** 158.

### Vanasse (120)

(see under silver)

### Venus

(see Deer Trail under silver)

### Victory

(see Vanasse under silver)

### Viking (19)

**Loc:** Sec. 36, (40-36E) and sec. 1, (39-36E), Orient dist. **Elev:** 1,575 to 2,525 ft. **Access:** Near road. **Prop:** 3 claims: Mountain Conn, Jasperell, Maid of Erin. **Owner:** Abandoned (1941). **Ore:** Copper, gold, silver. **Ore min:** Pyrite, chalcopryrite, few specks of galena. **Gangue:** Quartz. **Deposit:** Granitic gneiss cut by diorite dikes and overlain by latite flows. A quartz vein on the Mountain Conn claim is mineralized. Also a small mineralized zone on the Jasperell claim. **Dev:** 130-ft. adit, 80-ft. shaft, two 12-ft. shafts, several other shafts, total about 250 ft. **Ref:** 30, p. 130. 164, p. 291.

### Vulcan (191)

**Loc:** Near center sec. 16, (31-39E), due S. of the Edna mine near headwaters of Meadow Cr., Chewelah dist. **Elev:** 3,050 to

3,400 ft. **Access:** ½ mi. from road. **Prop:** State land. **Owner:** J. Richard Brown, lessee (1914). **Ore:** Copper, silver. **Ore min:** Surface ores largely malachite, azurite, with some cuprite and chalcopryrite. **Deposit:** Vein in calcareous argillite and schist, highly oxidized and leached in upper workings. **Dev:** 630-ft. crosscut, 112-ft. adit, two 40-ft. shafts. **Assays:** Ore said to carry some Ag. **Ref:** 30, p. 46. 164, pp. 184-185.

#### Wabash-Detroit (189)

**Loc:** NW cor. sec. 10, (31-39E), Chewelah dist., ½ mi. E. of Vulcan property. **Owner:** Northwest Magnesite Co., Chewelah, Wash. **Ore:** Copper. **Ore min:** Chalcopryrite. **Deposit:** Reddish quartz vein in calcareous argillite and schist. **Dev:** 60-ft. shaft. **Ref:** 30, p. 44. 164, p. 185.

#### Walking Boy (69)

**Loc:** Sec. 17, (39-38E), NE, of the Centennial claim with David Harum claim intervening, Orient dist. **Prop:** 1 claim. **Ore:** Copper. **Ore min:** Pyrite, chalcopryrite. **Gangue:** Quartz. **Deposit:** Formation is argillite cut by aplite and kersantite dikes. Vein, which appears to be an extension of that on the Centennial claim, occurs in one of the dikes and carries a little mineral. **Dev:** Several shallow shafts and small open cuts. **Ref:** 164, pp. 254-255.

#### Wall Street (68)

**Loc:** SE¼SW¼ sec. 35, (39-39E), Northport dist. **Access:** Logging road and trail from Onion Cr. road. **Owner:** George Van Stone, Northport, Wash. (1943). **Ore:** Copper, zinc (?), reportedly nickel. **Ore min:** Pyrite, pyrrhotite, tetrahedrite (?), malachite, azurite, and either siderite or sphalerite. **Deposit:** A 2- to 4-ft. quartz vein along a shear zone in limy argillite is sparsely mineralized. Also a limy argillite near intrusive granite is heavily mineralized with iron sulfides. **Dev:** 30-ft. inclined shaft, caved shaft, and inaccessible adit. **Ref:** 158.

#### War Eagle (74)

(see under gold)

#### Washington

(see Montana and Washington)

#### Western Molybdenum

(see Juno-Echo)

#### White Elephant (5)

(see under gold)

#### White Horse (41)

**Loc:** Sec. 19, (40-39E), on S. slope of Church Hill Mtn. **Elev:** 3,650 ft. **Access:** Near road, about 19 mi. NW. of railroad at Northport. **Prop:** 3 unpatented claims. **Owner:** B. J. Hofer and associates, Northport, Wash. (1941-1948). **Ore:** Copper, gold, silver. **Ore min:** Pyrite, chalcopryrite, pyrrhotite, and some galena, sphalerite, arsenopyrite. **Deposit:** Several narrow quartz veins in schistose volcanics. **Dev:** 300 ft. of workings in 2 shafts, and a 90-ft. adit. **Assays:** Ore said to range from \$18 to \$60 per ton. Five samples gave a weighed av. of 2.4% Cu, 0.15% Pb, 0.45% Zn, 0.054 oz. Au, 1.91 oz. Ag for av. width of 1.8 ft. **Ref:** 30, p. 91. 157. 158.

#### Wilkie Lode (142)

(see under lead)

#### Williams Lake (108)

**Loc:** Sec. 25, (38-39E), on Onion Cr. **Access:** Road. **Prop:** Several unpatented claims. **Owner:** Abandoned (1941). **Ore:** Copper. **Deposit:** Small fissure veins carrying values in copper. **Dev:** Caved open cut. **Ref:** 30, p. 86.

#### Windfall (166)

**Loc:** Near center W¼ sec. 16, (32-41E), ¼ mi. S. of the U. S. Copper Gold property, Chewelah dist. **Elev:** 2,600 to

2,775 ft. **Access:** A short distance by trail from the Schmeller School road. **Prop:** 2 claims: Evening Star, Nickel Plate; and State lease land. **Owner:** A. I. Kulzer, Chewelah, Wash. (1941). Windfall Mining Co. (1907-1920). **Ore:** Copper, gold, silver, nickel, lead. **Ore min:** Arsenopyrite, chalcopryrite, pyrite, galena. **Deposit:** Sparsely mineralized quartz vein 3 to 8 ft. wide in silicified limestone. Numerous dikes nearby. **Dev:** 90-ft. inclined shaft and a crosscut adit aggregate 1,000 ft. of workings. **Assays:** Values in gold, silver, and nickel reported. **Ref:** 7, p. 108. 30, p. 38. 114, no. 5, 1907, p. 12; no. 7, 1907, p. 13; no. 6, 1908, p. 123. 164, pp. 160-161.

#### Winslow (139)

(see under lead)

#### Young America (101)

(see under zinc)

### THURSTON COUNTY

#### Skookumchuck (1)

**Loc:** Near center SW¼NW¼ sec. 16, (15-1E), on N. bank of Skookumchuck R. **Access:** Road. **Ore:** Copper. **Deposit:** Very thin sheets of native copper along joints in basalt. **Dev:** Shaft. **Ref:** 158.

### WHATCOM COUNTY

#### Azurite (18)

(see under gold)

#### Beck (14)

(see Beck and Short Grub under gold)

#### Bismarck (17)

(see under gold)

#### Boundary Red Mountain (5)

(see under gold)

#### Chain Lakes (11)

(see under zinc)

#### Conway (4)

**Loc:** SW¼ sec. 24, (40-8E), on Damfino Cr. **Ore:** Copper. **Ore min:** Chalcopryrite, pyrite. **Deposit:** Vein in slaty argillite and greenstone. **Dev:** Long adit. **Ref:** 158.

#### Evergreen (9)

(see under gold)

#### Galena

(see Veronia under gold)

#### Gargett (6)

(see under gold)

#### Glacier

(see Midas)

#### Gold Hill (19)

(see under silver)

#### Gold Run

(see under gold)

#### Great Excelsior (3)

(see under gold)

#### Hyatt (1)

**Loc:** Sec. 17, (40-5E). **Ore:** Copper. **Ref:** 58, p. 31.

#### Lincoln

(see Great Excelsior under gold)

#### Midas (Glacier) (2)

**Loc:** Secs. 4, 5, 8 and 9, (39-7E), Mt. Baker dist. **Access:** About 50 ft. off the Mt. Baker highway at a place 1½ mi. NE.

of Glacier. **Prop:** 14 unpatented claims (1952). **Owner:** Glacier Mining Co., Seattle, Wash. (1949—). J. B. McLean et al., Hamilton, Wash. (1944). **Ore:** Copper, gold, silver. **Ore min:** Pyrite and some chalcopryrite. **Gangue:** Quartz, altered argillite. **Deposit:** Crushed zone in schist 4 to 5 ft. wide contains large chunks of nearly solid pyrite, surrounded by a crushed schist and clay. Large sulfide-bearing boulders occur as float. Company is exploring for source of boulders. (1952). **Dev:** 30-ft. adit, a long lower adit, numerous deep open cuts. **Assays:** Picked samples reportedly assay as much as 8% Cu. Av. value reported to be \$10 per ton. **Ref:** 133, p. 33. 158.

#### Northern Cascade

(see Gold Hill under silver)

#### Peterson

**Loc:** Mt. Baker dist. In canyon on second creek W. of Twin Lks.; this creek flows into Swamp Cr. **Access:** Trail. **Ore:** Copper. **Ore min:** Chalcopryrite. **Deposit:** Quartz vein in metasediments which are intruded by andesite. **Dev:** 40-ft. adit, winze. **Ref:** 158.

#### Peterson (Gold Hill)

(see Gold Hill under silver)

#### President

(see Great Excelsior under gold)

#### Red Mountain

(see Boundary Red Mountain under gold)

#### Saginaw (7)

(see under gold)

#### Shanghai (15)

(see under gold)

#### Short Grub

(see Beck and Short Grub under gold)

#### J. E. Sigh (8)

**Loc:** Mt. Baker dist., at Twin Lks. **Owner:** O. A. Lowery, Amos Jimmers, Shuksan, Wash. (1934). **Ore:** Copper, gold. **Dev:** 50 ft. of adits. **Ref:** 158.

#### Silver Creek (13)

(see under molybdenum)

#### Silver Tip (10)

**Loc:** Sec. 35, (40-9E), on Ruth Cr., Mt. Baker dist. **Access:** 4 mi. up Ruth Cr. from Shuksan by road. **Prop:** 11 unpatented claims. **Owner:** Silver Tip Mining Co., Ray Block, Bellingham, Wash. (1949-1952). **Ore:** Copper, gold, silver. **Ore min:** Pyrrhotite, pyrite, small amounts of chalcopryrite and malachite. **Gangue:** Quartz, calcite. **Deposit:** Ore minerals occur as disseminations in siliceous limestone and along shear zones. Zones of shearing are strong, but mineralization is weak. **Dev:** 365-ft. adit, 70-ft. adit. **Improv:** Bunkhouse, 2,600-ft. tram, bunker, small mill, cabin (1949). **Assays:** Said to run 4% Cu, \$5.00 Au, \$10.00 Ag. **Prod:** Shipped a car of ore valued at \$27 per ton. Produced 1943 (\$146), 1947 (27 tons). **Ref:** 22, p. 11. 68, p. 16. 158.

#### Veronia (12)

(see under gold)

#### Whistler (16)

(see under gold)

#### Yellow Aster

(see under nickel)

### YAKIMA COUNTY

#### Bird (4)

(see under tungsten)

#### Black Jack (11)

(see under zinc)

#### Chinook (3)

**Loc:** SW $\frac{1}{4}$  sec. 12, (16-10E). **Access:** On Chinook Pass highway 1 $\frac{1}{2}$  mi. E. of Chinook Pass. **Prop:** 3 unpatented claims. **Owner:** Hidden Treasure Mines, Inc., Yakima, Wash. (1954—). Orie O. Smalley and H. C. Lawson, Prosser, Wash. (1947). **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, with a little arsenopryrite, sphalerite, pyrite, galena, molybdenite. **Gangue:** Granodiorite. **Deposit:** Ore minerals occur in a pocket or lens 4 to 5 ft. wide along the contact of iron-stained granodiorite and andesite. **Dev:** 50-ft. adit, 30-ft. winze with a 15-ft. crosscut, 550-ft. diamond drill hole. **Assays:** 21 tons shipped ran 10% Cu, 27 oz. Ag, \$5 Au. **Prod:** 21 tons shipped to smelter in 1941. **Ref:** 158.

#### Copper Mining Co. (5)

(see also New Find, Pasco under copper, and Bird, Garibaldi under tungsten)

**Loc:** Secs. 12 and 13, (15-11E), secs. 7, 8, 17, 18, and 19, (15-12E), on Miners Ridge, Bumping Lk. dist. **Elev:** 4,000 to 6,000 ft. **Access:** 70 mi. by road to Yakima. **Prop:** 42 unpatented claims. **Owner:** Copper Mining Co., Yakima, Wash. (1906—). **Ore:** Copper, tungsten, gold, silver, molybdenum. **Ore min:** Chalcopryrite, arsenopryrite, molybdenite, scheelite, pyrite, bornite, malachite. **Gangue:** Quartz, tourmaline, calcite. **Deposit:** Mineralized quartz veins along shear zones in granite. Mineralization rather sparse. **Dev:** 3 Bird adits, Garibaldi adit, 2 New Find adits, Pasco adit, totaling more than 1,000 ft., numerous open cuts. **Assays:** Tr. Au, 0.60 to 2.00 oz. Ag, 1.15% to 3.35% Cu, tr. to 11.50% WO<sub>3</sub>, 0.13% MoS<sub>2</sub>. **Prod:** 1907; 11 tons copper conc. (1938); 650 lb. scheelite conc. (1941). **Ref:** 9. 37, pp. 79-84. 41. 59. 97, 1937, p. 654; 1939, pp. 492, 618. 104, 9/15/34, p. 25; 9/30/34, p. 22. 158.

#### Deep Creek

(see Black Jack under zinc)

#### Elizabeth Gold Hill (2)

(see under gold)

#### Gold Hill (1)

(see under gold)

#### Green

(see Black Jack under zinc)

#### Hidden Treasure (3A)

(see also Chinook)

**Loc:** S $\frac{1}{2}$  sec. 4, (16-11E), near Morse Cr. **Access:** On Chinook Pass highway 5 mi. E. of Chinook Pass. **Owner:** Hidden Treasure Mines, Inc., Yakima, Wash. (1954—). **Ore:** Copper, gold, silver. **Ore min:** Chalcopryrite, pyrite, pyrrhotite, sphalerite. **Deposit:** Slight mineralization along joints and disseminated in calcareous siltstone near granite contact. **Dev:** 400-ft. crosscut with 2 drifts, 75 to 100 ft. long. **Ref:** 158.

#### Keystone (9)

**Loc:** Approx. in sec. 15, (15-12E), on E. side of Deep Cr. Valley a few hundred ft. above the creek, Bumping Lk. dist. **Elev:** 4,500 ft. **Access:** About  $\frac{1}{2}$  mi. by trail from the Deep Cr. road. **Prop:** 12 unpatented claims. **Owner:** William Pemberton and Sam Harlow, Yakima, Wash. (1941). **Ore:** Copper, lead, tungsten. **Ore min:** Chalcopryrite, arsenopryrite, galena, wolframite, scheelite. **Deposit:** A fault zone 30 in. wide is sparsely mineralized. **Dev:** 90-ft. adit. **Ref:** 58, p. 36. 158.

#### New Find (6)

(see also Copper Mining Co.)

**Loc:** Near S. line sec. 19, (15-12E), Bumping Lk. dist. **Elev:** 4,300 ft. **Access:** A few hundred yards W. of Copper City, 70



mi. by road from Yakima. **Owner:** Copper Mining Co., Yakima, Wash. (1906—). **Ore:** Copper, gold, silver, tungsten. **Ore min:** Chalcopyrite, arsenopyrite, pyrite, scheelite. **Gangue:** Quartz, tourmaline. **Deposit:** Quartz veins along a fracture zone in granite several feet wide. **Dev:** 2 adits and some open cuts. **Assays:** 11 tons conc. assayed 19.6% Cu, 100 oz. Ag, 1 oz. Au. **Prod:** 11 tons copper conc. (1938). **Ref:** 37, pp. 83-84.

#### Pasco (7)

(see also Copper Mining Co.)

**Loc:** NE $\frac{1}{4}$  sec. 19, (15-12E), Bumping Lk. dist. **Elev:** 4,400 ft. **Access:** Road from Copper City. 70 mi. by road from Yakima.

**Owner:** Copper Mining Co., Yakima, Wash. (1906-1945). **Ore:** Copper. **Ore min:** Chalcopyrite, pyrite, reportedly scheelite, galena (?). **Gangue:** Chlorite. **Deposit:** Iron-stained zone 6 to 8 in. wide. **Ref:** 37, p. 83.

#### Richmond (8)

(see under lead)

#### Twin Sisters Lakes (10)

**Loc:** On W. shore of the larger of the two Twin Sisters Lakes, probably in sec. 35, (15-11E). **Ore:** Copper. **Deposit:** Said to be a large vein. **Ref:** 158.

## GALLIUM

**Properties**—Gallium is an unusual metallic element that is molten on warm days (86° F.) but does not boil below 3600° F. The only other metals that are liquid at similarly low temperatures are mercury, cesium, and rubidium, but none of these has a boiling point nearly so high as that of gallium. The metal is lustrous and grayish white. It is crystalline and hard and has low malleability. Unlike most other metals, it expands upon solidification. The electrical resistivity and coefficient of thermal expansion of gallium vary greatly with the directions of the three axes of its crystallographic structure. Its electrical resistivity is believed to vary more than that of any other metal. Gallium emits electrons at extremely low temperatures. It alloys or amalgamates with many metals, and most of its alloys and amalgams are liquid at room temperatures. Gallium adheres to and spreads as a thin film on glass. It is nonpoisonous to animals. Gallium salts are similar to those of aluminum. Other properties are given in the table on page 12.

**Uses**—Although gallium has several unusual properties, no quantitatively important uses for the metal have been developed as yet. It is used in dental alloys, in selenium rectifiers, and as a liquid seal on the inlet system of mass spectrometers, where its liquid range and low vapor pressure make it superior to mercury. It is used in direct-reading high-temperature thermometers, as an excitant in phosphors, and experimentally as a catalyst; and radioactive gallium has been used in the diagnosis and treatment of bone cancer. Gallium has been used to put bright reflective film on glass, and to make low-melting-point industrial alloys. A fairly strong solder which melts at 57° C. is made by adding 10 percent mercury and 0.6 percent gallium to bismuth.

**Production**—In the past few years a few pounds of gallium have been produced annually in the United States as byproducts of smelting aluminum, copper, and zinc. In England the metal is recovered from flue dusts. Although total consumption of the metal for the year 1951 is estimated to be less than 100 pounds, much larger quantities could be produced as a byproduct if and when the demand exists. Production in 1950 came from plants located in Montana, Illinois, Missouri, and New York.

**Prices**—Gallium in 1932 was quoted at \$2.50 per gram, and by 1936 it could be bought in lots of several pounds at \$1.50 per gram, but in smaller lots the price was \$3.00 a gram. Standard-grade metal for experimental use was still quoted at \$3.00 a gram in 1955. Higher purity (99.9 percent) metal sold at from \$3.00 to \$4.50, depending upon the size of the order. Metal of 99.99-percent purity commanded a premium of 25 cents per gram.

**Ore minerals and geology**—The richest known source of gallium is the copper mineral, germanite,  $\text{Cu}_3(\text{Ge,Ga,-Fe,Zn})(\text{As,S})_4$ , which contains up to 2 percent gallium, but it is never mined specifically for its gallium content. Gallium occurs in a variety of ores but usually in small amounts ranging from a trace to 0.1 percent, and usually less than 0.05 percent. The metal is commonly detected in sphalerite, and it is recovered as a byproduct of zinc smelting and refining. Likewise, it has been recovered from copper smelters and from flue dusts in which it accumulates from the burning of gallium-bearing coals. It is recovered from aluminum ores, in which it is a fairly common constituent. It also occurs in some high-alumina clays and ores of iron, chromium, and manganese, and in some pegmatites, almost always in amounts of less than 0.1 percent.

## OCCURRENCES

The map showing the numbered gallium occurrences is plate 3, on page 11 in volume 2.

### CHELAN COUNTY

#### Entiat (1)

**Loc:** Headwaters of Entiat R. **Ore:** Gallium. **Ref:** 158.

#### Lovejoy (2)

**Loc:** Sec. 20, (25-21E),  $\frac{3}{4}$  mi. S. of Entiat. **Access:** On highway and railroad. **Prop:** 70 acres deeded land. **Owner:** Harry Lovejoy, 516 Methow St., Wenatchee, Wash. **Ore:** Gallium. **Deposit:** Hornblende gabbro. **Assays:** Owner reports 0.001% to 0.01% gallium by spectrographic analysis. **Ref:** 157.

### FERRY COUNTY

#### Aavestrud (1)

**Loc:** Republic dist. **Owner:** Ole Aavestrud, Republic Wash. (1949). **Deposit:** A conc. produced by panning contained a trace of gallium. **Ref:** 158.

### KING COUNTY

#### Prufer (1)

**Loc:** Sec. 27, (25-10E), N. Fk. of Snoqualmie R. **Owner:** Robert Prufer, North Bend, Wash. (1951). **Deposit:** Sample from a basaltic dike contained a trace of gallium. **Ref:** 158.

## PEND OREILLE COUNTY

**O. K. (2)**

(see under silver)

**Pend Oreille Mines & Metals Co. (1)**

(see under zinc)

## STEVENS COUNTY

**Advance (2)**

(see under zinc)

**Black Rock (3)**

(see under zinc)

**Farmer (4)**

(see under zinc)

**Lucile (1)**

(see under zinc)

**New England (5)**

(see under zinc)

**Old Dominion (6)**

(see under silver)

## GERMANIUM

**Properties**—Germanium is a rare metal allied to tin. It is grayish white, lustrous, crystalline, light in weight, hard, and brittle. It is a semiconductor of electricity, a property which is utilized in the manufacture of electronic devices. Germanium expands upon solidification. It amalgamates with mercury and is known to form alloys with aluminum, copper, silver, magnesium, and some other metals. It is resistant to corrosion and is stable in air at temperatures up to 600° C. It has valences of 2 and 4 and forms two corresponding series of compounds. Other properties are shown in the table on page 12.

**Uses**—Germanium had very few uses for many years, having only minor use in medicine and as magnesium germanate for a phosphor in fluorescent lights. It has been used as a catalyst in the hydrogenation of coal, and as a substitute for silica in making a highly refractive optical glass. It has been used also in making a new type of photoelectric cell. In 1950 the principal use was in the metallic form in diode rectifiers for high-frequency electrical currents in radar and television circuits. Probably the greatest potential use for germanium, and certainly the use in which the greatest interest was being shown in 1952, is in transistors, the three-element electronic devices which act like triode radio tubes for amplifiers. The transistors have advantages over radio tubes in being much smaller, lighter in weight, and longer lived, and in requiring no filament current.

**Production**—Commercial production of germanium began in this country about in 1941. In 1950 the principal production was as a byproduct of zinc refining at Joplin,

Missouri, but small production was coming from at least two other plants in Pennsylvania and New York. Production was at the rate of 1,000 pounds per year in 1948 but had increased to 6,000 pounds in 1951 and was expanding rapidly. Germanium is recovered from flue dusts in England. Zinc concentrates from the Metaline district in Washington are germaniferous, hence have been shipped to Mississippi Valley smelters, where the germanium is recoverable in horizontal-retort smelters.

**Prices**—Germanium metal was quoted in 1936 at \$5.50 per gram, and in 1940 at \$4,500 per pound, but by 1946 it had dropped to \$180 per pound. The price then rose until it reached \$340 per pound in 1952. In June 1955 the price was \$295 per pound.

**Ore minerals**—Germanium occurs in amounts up to 10 percent in germanite,  $\text{Cu}_3(\text{Ge,Ga,Fe,Zn})(\text{As,S})_4$ . Renierite, similar to germanite except that it contains tin, carries from 6 to 8 percent germanium. Argyrodite,  $4\text{Ag}_2\text{S} \cdot \text{GeS}_2$ , contains about 7 percent germanium but is very rare, as are all germanium minerals.

**Geology**—Germanium is widely distributed in nature as a very minor constituent in many common minerals, but rarely is it naturally concentrated enough to be recoverable. It is found in some coals to the extent of about 0.001 percent, and flue dusts from the burning of such coals contain up to 9 percent germanium. The metal is found in some zinc ores, and in the Tri-State district it occurs in amounts from 0.01 to 0.1 percent. It is found in like amounts in some ores of silver, tin, copper, and iron.

## OCCURRENCES

The map showing the numbered germanium occurrences is plate 3, on page 11 in volume 2.

## PEND OREILLE COUNTY

**Pend Oreille Mines & Metals Co. (1)**

(see under zinc)

## STEVENS COUNTY

**Advance (1)**

(see under zinc)

**Black Rock (2)**

(see under zinc)

**Farmer (3)**

(see under zinc)

**New England (4)**

(see under zinc)

## GOLD

**Properties**—Gold is bright yellow when pure, but the color intensity varies to lighter or darker with the amount of silver or copper present. Gold powder produced by precipitation or volatilization is violet, purple, or ruby

colored. Gold is very heavy and soft and is the most ductile and malleable of metals. It is a good conductor of heat and electricity, its electrical conductivity being exceeded only by silver and copper. The element is not